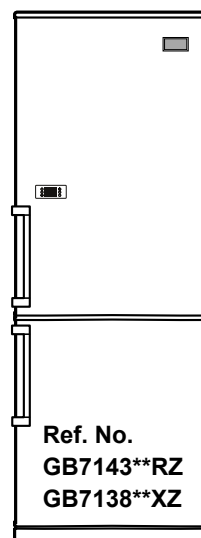
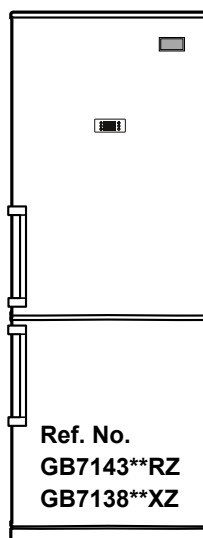
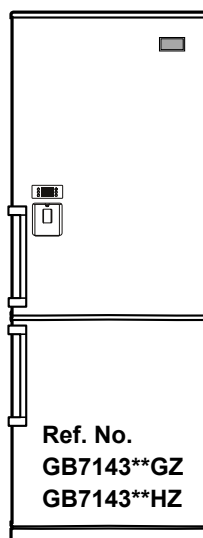
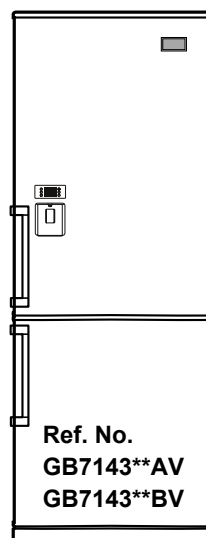


REFRIGERATOR

SERVICE MANUAL

CAUTION

BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS" IN THIS MANUAL.



MODEL :

COLOR :

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SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1. Check the set for electric losses.
2. Unplug prior to servicing to prevent electric shock.
3. Whenever testing with power on, wear rubber gloves to prevent electric shock.
4. If you use any kind of appliance, check regular current, voltage and capacity.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite.
6. Prevent water from flowing onto electric elements in the mechanical parts.
7. When standing up after having checked the lower section of the refrigerator with the upper door open, move with care to avoid hitting the upper door.
8. When tilting the set, remove any materials on the set, especially the thin plates(ex. Glass shelf or books.)
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Leave the disassembly of the refrigerating cycle to a specialized service center. The gas inside the circuit may pollute the environment.
11. When you discharge the refrigerant, wear the protective safety glasses or goggle for eye safety.
12. When you repair the cycle system in refrigerator, the work area is well ventilated. Especially if the refrigerant is R600a, there are no fire or heat sources. (No smoking)

SERVICING PRECAUTIONS

Features of refrigerant (R600a)

- Achromatic and odor less gas.
- Flammable gas and the ignition (explosion) at 494°C.
- Upper/lower explosion limit: 1.8%~8.4%/Vol.

Features of the R600a refrigerator

- Charging of 60% refrigerant compared with a R134a model.
- The suction pressure is below 1bar (abs) during the operation.
- Because of its low suction pressure, the external air may flow in the cycle system when the refrigerant leak, and it causes malfunction in the compressor.
- The displacement of compressor using R600a must be at least 1.7 times larger than that of R134a.
- Any type of dryer is applicable (XH-5, 7, 9).
- The EVAPORATOR or any other cycle part that has welding joint is hidden in the foam. (If not hidden inside, the whole electric parts must be tested with the LEAKAGE TEST according to the IEC Standard.)
- The compressor has label of the refrigerant R600a.
- Only the SVC man must have an access to the system.

Installation place

- Must be well ventilated.
- Must be 20 m³ or larger.
- Must be no-smoking area.
- No ignitable factors must be present.

Utilities

- Refrigerant cylinder (MAX NET 300g)
- Manometer
- Vacuum pump (600 ℓ /min)
- Piercing Clamp
- Quick coupler
- Hoses (5m-1EA, 1m-3EA)
- LOKRING
- Portable Leakage detector (3g/year ↓)
- Nitrogen cylinder (for leakage test)
- Concentration gauge

Make sure before Servicing

- Refrigerant
Confirm the refrigerant by checking Name Plate and the label on the compressor, after opening the COVER ASSEMBLY, BACK-M/C.
- If the refrigerant is R600a, you must not weld or apply a heat source.

Air Recharging in Compressor

Before refilling the refrigerant, you must perform the test according to Chapter 5 (TROUBLESHOOTING CHART). When the defects are found, you must discharge the residual refrigerant (R600a) in the outdoor. For discharging the refrigerant R600a, break the narrow portion of tube extension by hand or with a pipe cutter as shown in Figure 1. Leave it for 30min in outside to stabilize the pressure with ambient. Then, check the pressure by piercing the dryer part with piercing pliers. If the refrigerant is not completely discharged, let the refrigerator alone for more 30min in outside.

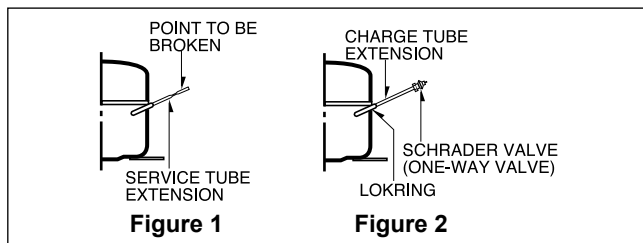


Figure 1

Figure 2

Attach the service tube installed with a Schrader valve (one-way valve) by using the LOKRING (Figure 2). Then, connect the Schrader valve (one-way valve) to the pump that is connected to the discharging hose leading to the outside. When discharging the residual refrigerant, repeat 3 cycle that includes 3min of the pump running->pump off->30sec of the compressor running.

After the refrigerant (R600a) is completely discharged, repair any defective parts and replace the dryer. At any case you must use the LOKRING for connecting or replacing any part in the cycle (No Fire, No Welding). Connect the Schrader valve to pump with the coupler. And then turn the pump on for vacuum state (Figure 3). Let the pump run until the low-pressure gauge indicates the vacuum (gauge pressure 0, absolute pressure -1atm or -760mmHg). Recommended vacuum time is 30 min. Charge the N₂ gas in order to check for leakage from welding points and the LOKRING. If leakages are found, repair the defects and repeat the vacuum process.

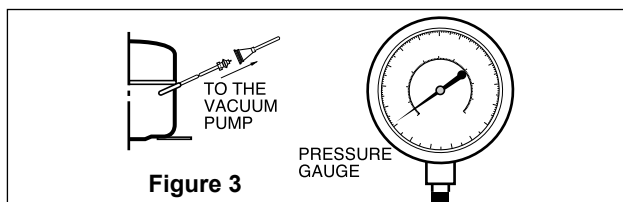


Figure 3

After the system is completely vacuumed, fill it with the refrigerant R600a up to what has been specified at your refrigerator Name Plate. The amount of refrigerant (R600a) must be precisely measured within the error of ±2g by an electron scale (Figure 4).

If you use the manifold connected with both the refrigerant (R600a) cylinder and the vacuum pump simultaneously, make sure the pump valve is closed (Figure 5).

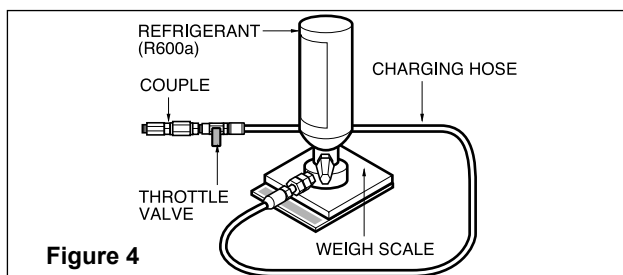


Figure 4

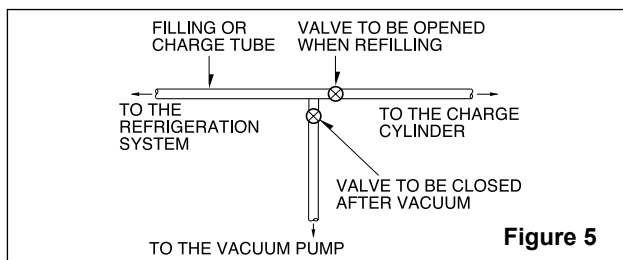


Figure 5

Connect the charging hose (that is connected to the refrigerant (R600a) cylinder) to the Schrader valve installed on the service tube. Then, charge the refrigerant (R600a) by controlling the Throttle valve. When you do so, do not fully open the Throttle valve because it may make damage to the compressor. Gradually charge the refrigerant (R600a) by changing open and close the Throttle Valve (5g at each time). The charging hose must use a one-way valve to prevent the refrigerant refluence. Close the Schrader valve cap after the refrigerant (R600a) is completely recharged.

After you completely recharge the refrigerant (R600a), perform the leakage test by using a portable leakage detector or soapy water. Test the low pressure (suction) parts in compressor off time and high pressure parts in compressor on time. If the leakages are found, restart from the refrigerant (R600a) discharging process and repairs defects of leaks.

After the leakage test, check the temperature of each parts of the cycle. Check with hands if the CONDENSER and the case (HOT-LINE pipe) that is contacted to the door gasket are warm. Confirm that frost is uniform distributed on the surface of the EVAPORATOR.

SPECIFICATIONS

1. Ref. No: GB7143*****

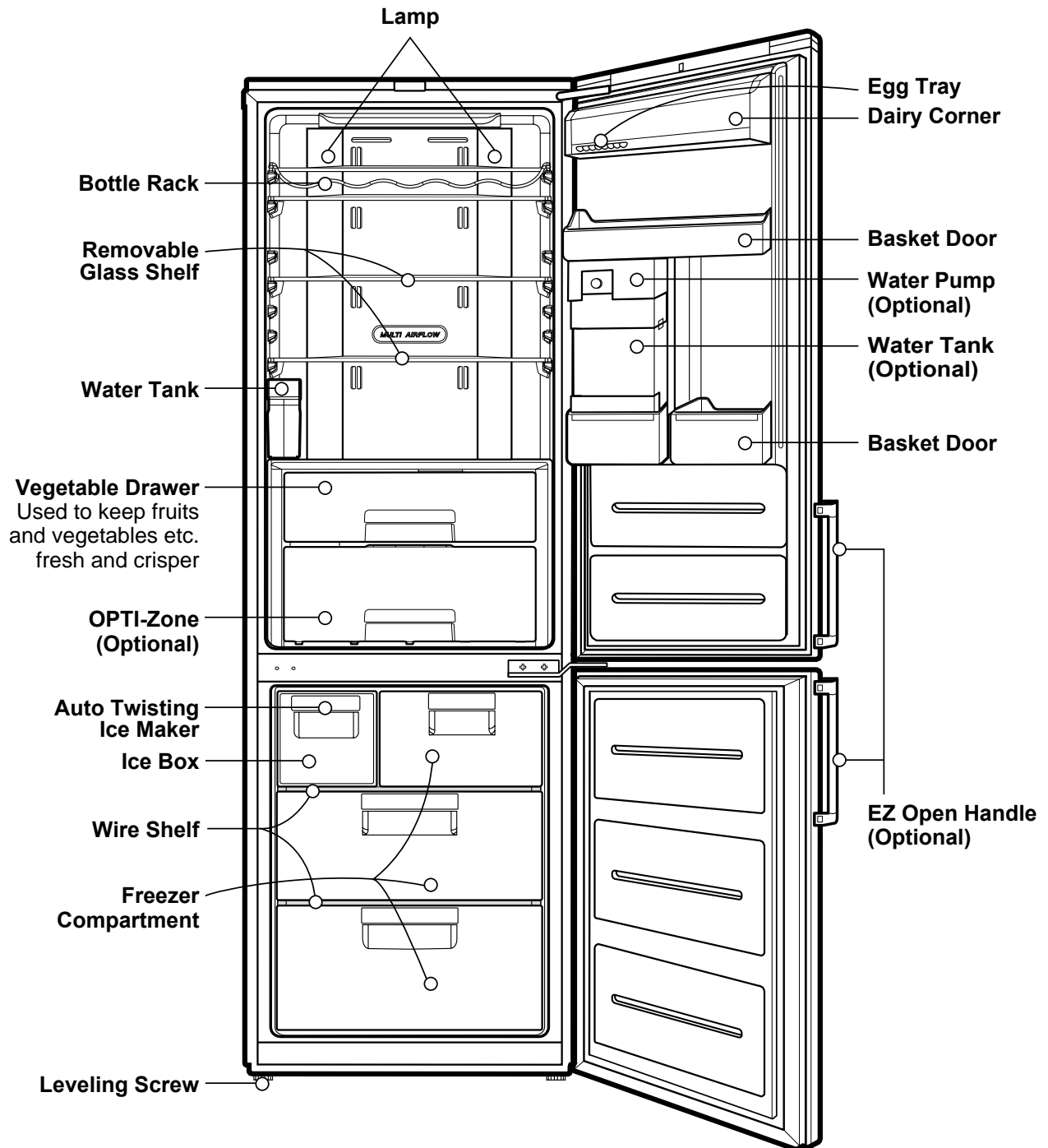
ITEMS		GB7143**(A/B)V	GB7143**(G/H)Z	GB7143**(G/H)W
DIMENSIONS (mm)	595(W) X 2010(H) X 671(D)	●	●	●
	595(W) X 1850(H) X 671(D)			
NET WEIGHT	-			
COOLING SYSTEM	Fan Cooling	●	●	●
TEMPERATURE CONTROL	Micom Control	●	●	●
DEFROSTING SYSTEM	Full Automatic	●	●	●
	Heater Defrost	●	●	●
DEFROSTING DEVICE	Heater, Sheath	●	●	●
	Heater, L-Cord	●	●	
REFRIGERANT WEIGHT	R600a	73g	73g	71g
LUBRICATION OIL	FREOL 60MT 310 cc	-	-	●
	FREOL 55MT 180 cc	●	●	-
COMPRESSOR	PTC Starting Type	●	●	●
EVAPORATOR	Pin Tube Type	●	●	●
CONDENSER	Wire Condenser	●	●	●
REFRIGERATOR COMPARTMENT	Removable Glass Shelf	3EA	3EA	3EA
	Bottle Rack (1EA)	●	●	●
	Vita, LED(1EA)	●	●	●
	Cover, TV (1EA)	●	●	●
	Rail (2EA)	●	●	●
	Magic Crisper (1EA)	●	●	●
	Vegetable Drawer (1EA)	●	●	●
	OPTI-Zone (1EA)	●	●	●
DOOR BASKET	Egg Tray	●	●	●
	Dairy Corner	●	●	●
	Basket Door	●	●	●
	Basket	●	●	●
	Water Tank	●	●	●
FREEZER COMPARTMENT	Tray Drawer (3EA)	●	●	●
	Ice bin (1EA)	●	●	●
	Twist Ice Maker Kit (1EA)	-	●	●
	Auto Ice Maker	●	-	-
	Guide, Rail (1EA)	●	●	●
	Wire Shelf (2EA)	●	●	●

2. Ref. No: GB71(43/38)*****

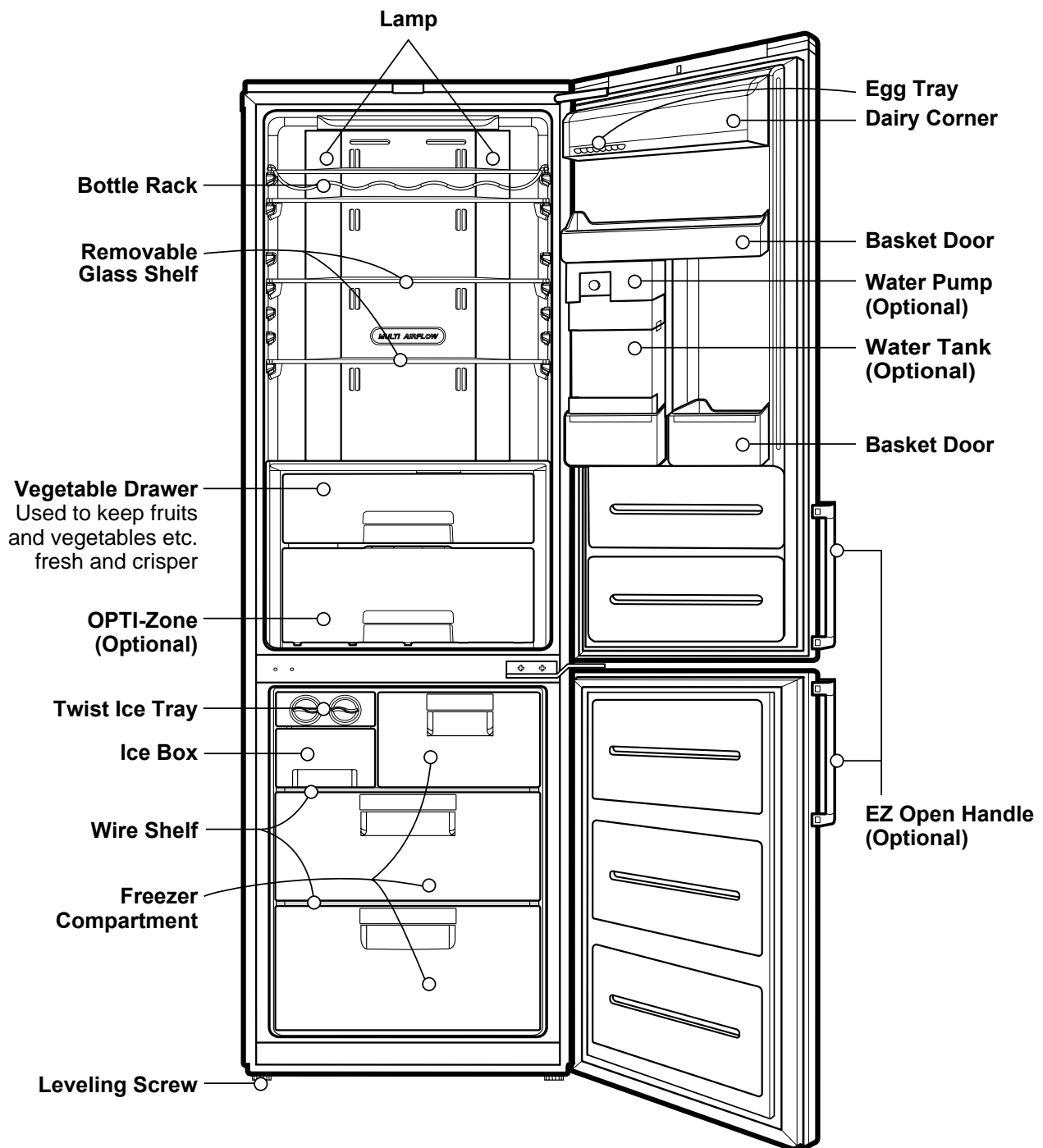
ITEMS		GB71(43/38)**(R/X)W	GB71(43/38)**(R/X)Z	GB71(43/38)**(P/V)W
DIMENSIONS (mm)	595(W) X 2010(H) X 671(D)	●	●	●
	595(W) X 1850(H) X 671(D)	●	●	●
NET WEIGHT	-			
COOLING SYSTEM	Fan Cooling	●	●	●
TEMPERATURE CONTROL	Micom Control	●	●	●
DEFROSTING SYSTEM	Full Automatic	●	●	●
	Heater Defrost	●	●	●
DEFROSTING DEVICE	Heater, Sheath	●	●	●
	Heater, L-Cord		●	-
REFRIGERANT WEIGHT	R600a	71g	73g	71g
LUBRICATION OIL	FREOL 60MT 310 cc	●	-	-
	FREOL 55MT 180 cc	-	●	●
COMPRESSOR	PTC Starting Type	●	●	●
EVAPORATOR	Pin Tube Type	●	●	●
CONDENSER	Wire Condenser	●	●	●
REFRIGERATOR COMPARTMENT	Removable Glass Shelf	3EA or 2EA	3EA or 2EA	3EA or 2EA
	Bottle Rack (1EA)	●	●	●
	Vita, LED(1EA)	-	-	-
	Cover, TV (1EA)	●	●	●
	Rail (2EA)	-	-	-
	Magic Crisper (1EA)	-	-	-
	Vegetable Drawer (1EA)	2EA	2EA	2EA
	OPTI-Zone (1EA)	-	-	-
DOOR BASKET	Egg Tray	●	●	●
	Dairy Corner	●	●	●
	Basket Door	-	-	-
	Basket	●	●	●
	Water Tank	-	-	●
FREEZER COMPARTMENT	Tray Drawer (3EA)	●	●	●
	Ice bin (1EA)	●	●	●
	Twist Ice Maker Kit (1EA)	●	●	●
	Auto Ice Maker	-	-	-
	Guide, Rail (1EA)	●	●	●
	Wire Shelf (2EA)	●	●	●

PARTS IDENTIFICATION

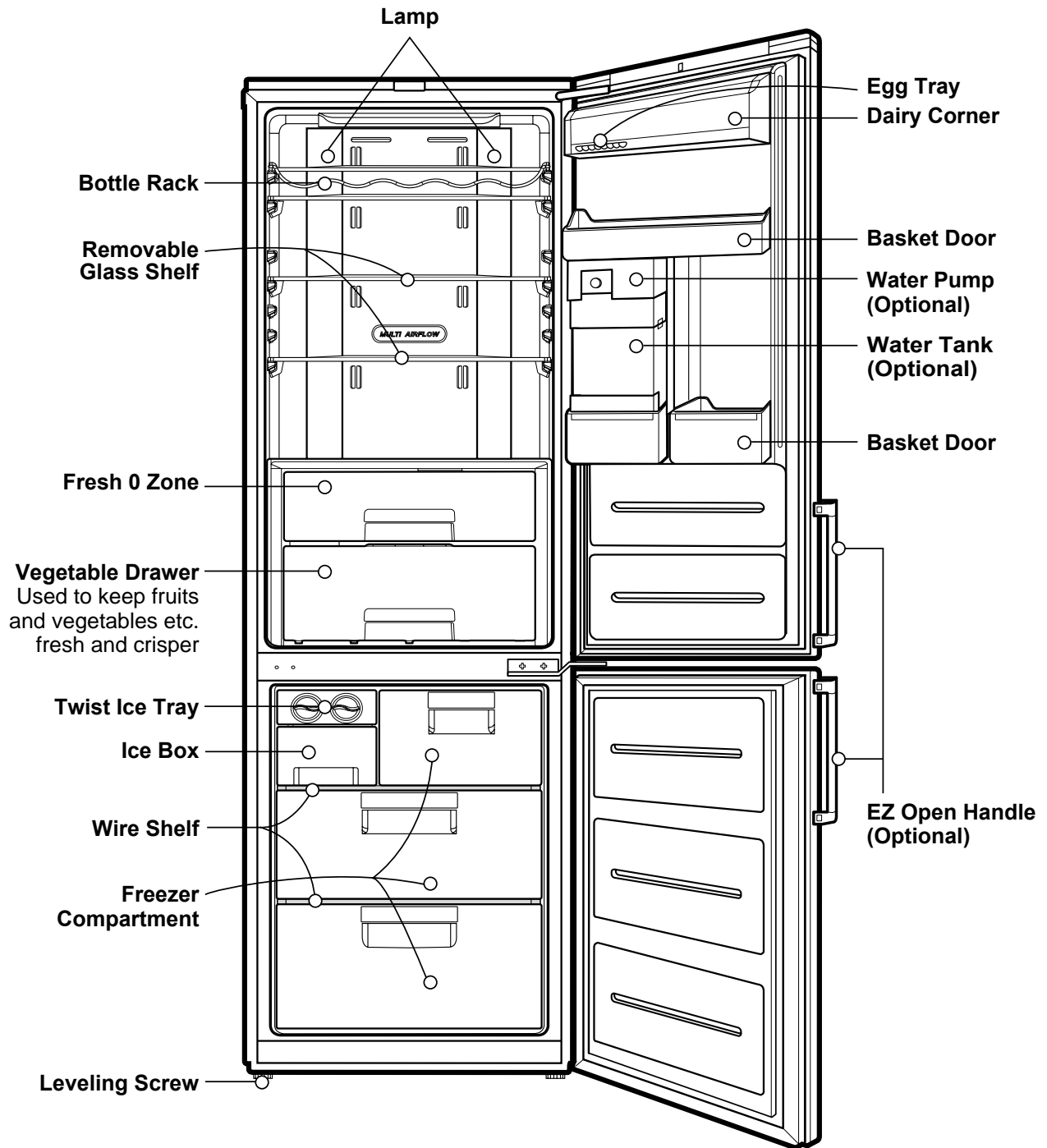
GB7143**(A/B)V



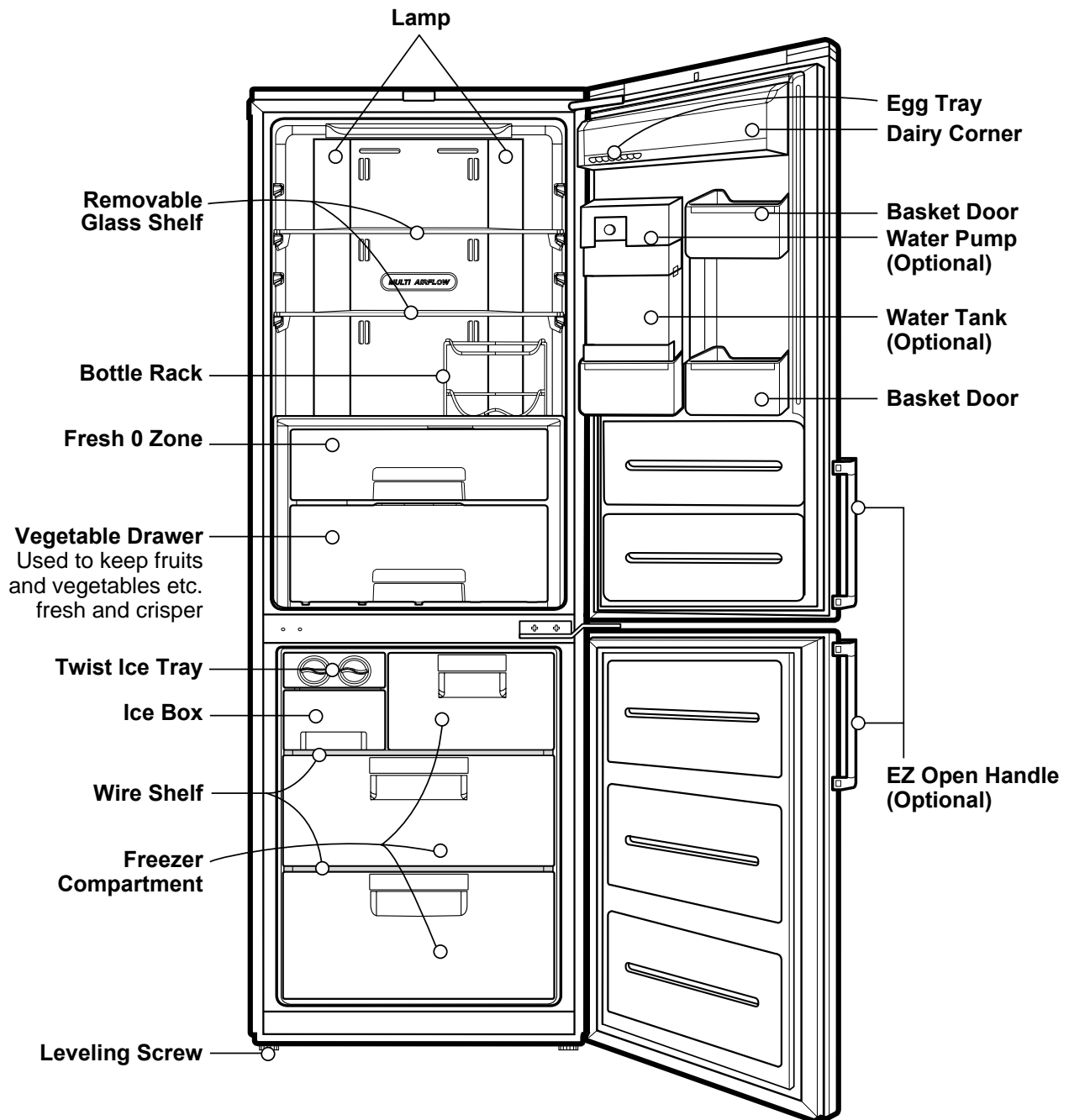
GB7143**(G/H)W/Z



GB7143PW, GB7143**R(W/Z)**



GB7138VW, GB7138**X(W/Z)**



INSTRUCTIONS FOR REVERSING DOOR SWING

This refrigerator allows the owner to change the door swing if desired. The hinging of the doors can be changed to the opposite side anytime you wish.

When reversing the door swing :

Read the instructions all the way through before starting.

- Handle parts carefully to avoid scratching paint.
- Set screws down by their related parts to avoid using them in the wrong places.
- Provide a non-scratching work surface for the doors.

IMPORTANT

Once you begin, do not move the cabinet until door-swing reversal is completed.

These instructions are for changing the hinges from the right side to the left side-if you ever want to change the hinges back to the right side, follow these same instructions and reverse all references to left and right.

Before Removing the Doors, empty and Remove all the Door Baskets of both Refrigerator/Freezer Doors, including the Bank Dairy. Close both doors before removing hinge pins.

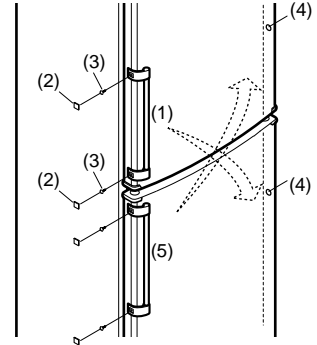
▲ Warning Electric Shock Hazard

Disconnect electrical supply to refrigerator before installing. Failure to do so could result in death or serious injury.

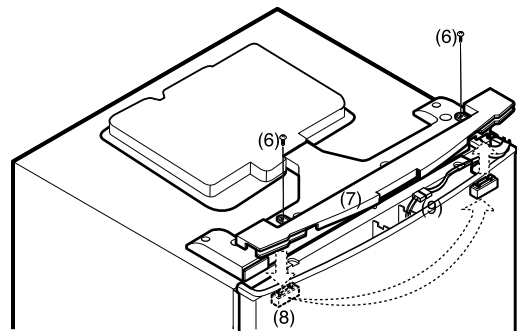
Caution :

Do not let either door drop to the floor. Doing so could damage the Door Stop.

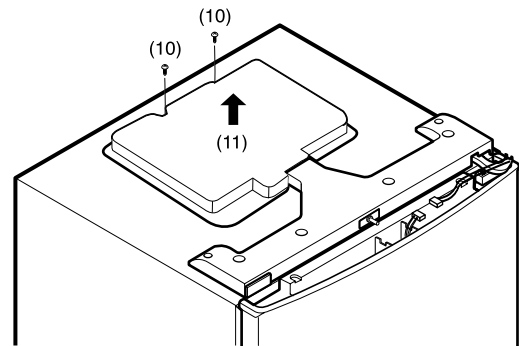
- 1) Remove screws(3) after removing a CAP(2) from the side of the refrigerator room HANDLE(1).
The freezer room HANDLE(5) may be also disassembled in a same way as the refrigerator room HANDLE(1).



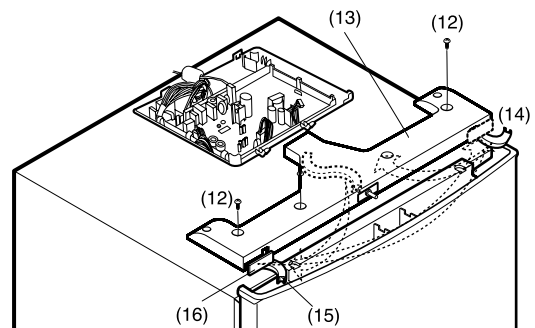
- 2) Remove the screws(6) in the DECO COVER(7).
Remove the DECO COVER(7) and move the COVER HINGE(8) to side of DECO COVER(7). Disassemble the Housing Connector(9) inside of the DECO COVER(7).



- 3) Remove the screws(10) in the COVER-PWB(11), and remove the COVER-PWB(11).

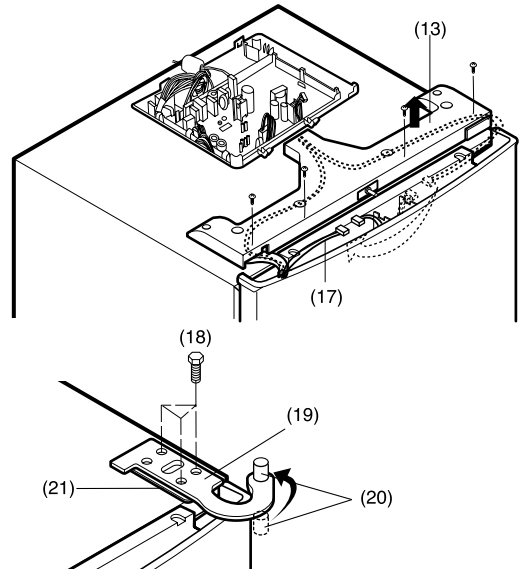


- 4) Remove the screws(12) in the TOP COVER FRONT(13) and remove the TOP COVER FRONT (13).
- 5) Remove the HOLDER CORD (14) placed in right and insert it to center. And then move COVER FRONT(16).
Take out the HOLDER CORD(spare) (15) and to place in the center of TOP COVER FRONT(13), and insert to the left side.

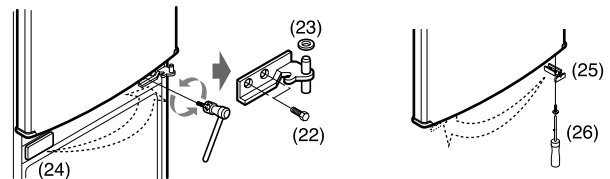


- 6) Take out the LEAD WIRE(17) assembly from the TOP COVER FRONT(13) and assemble it on left side.

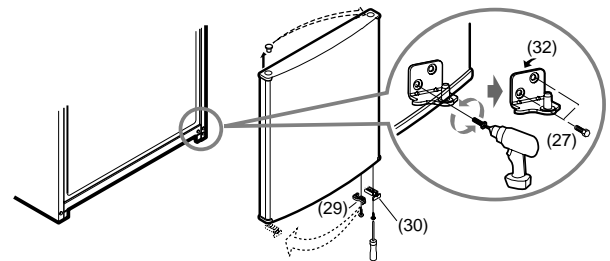
- 7) Remove bolts(18) securing HINGE-U(19). Unscrew of the hinge pin(20). Place HINGE-U and seat hinge upside down and apply them to left side of the refrigerator.
NOTE: Seat hinge to be placed under the HINGEU(19).



- 8) Remove bolts(22) securing HINGEC(23) and then remove HINGE-C(23). Remove the freezer door. Move in left side of the refrigerator CAP(24). Move to left side of the refrigerator door BRACKET DOOR(25) and screw(26).



- 9) Remove Bolts(27), HINGE-L(28), Stopper(29), (30) and Lavel(31). Use the new HINGE-L in Drawer and attach a label to a screw Hole.



- 10) Assemble the HINGE-L → Freezer Door → HINGE-C(23) → Refrigerator Door → HINGE-U(19) → TOP COVER FRONT(13) → COVER PWB(11) → Connect the Housing Connector(9) → DECO COVER(7) → HANDLE(1) (5)

Note:

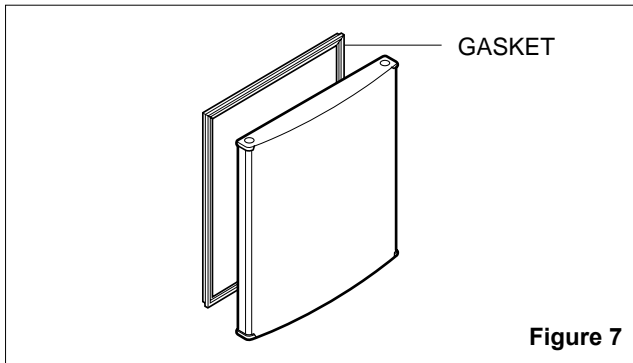
Reversing the doors is not covered by the warranty.

DISASSEMBLY

1. DOOR

● Freezer Door

- 1) Refer to previous chapter "Instruction for Reversing Door Swing".
- 2) Pull out the Door Gasket to remove from the Door Foam Assembly, F.

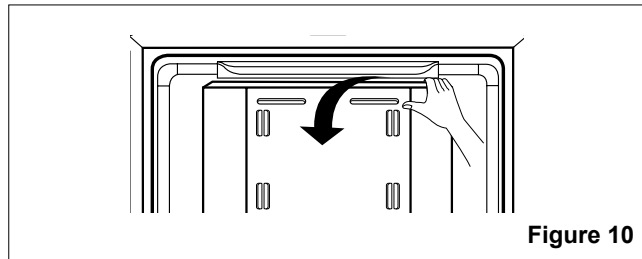


● Refrigerator Door

- 1) Refer to previous chapter "Instruction for Reversing Door Swing".
- 2) Pull out the Door Gasket to remove from the Door Foam Assembly, R.

3. REFRIGERATOR ROOM LAMP

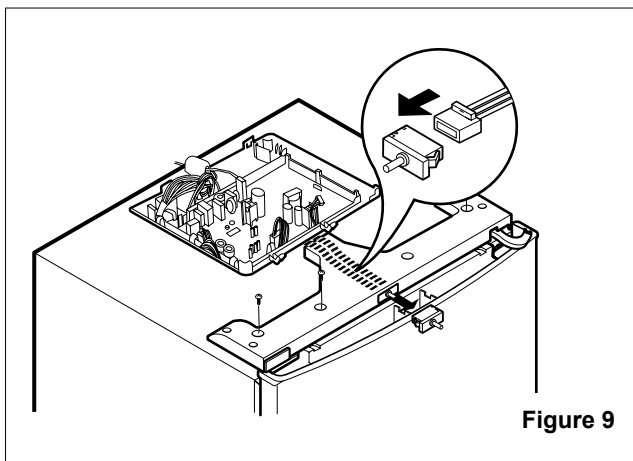
- 1) Unplug the power cord the outlet.
- 2) Remove all of the fridge compartment, (Involved removable glass shelf, wine rack etc.)
- 3) Remove one screws in Case, Control Refrigerator.
- 4) Pull out the Grille Fan and Case, Control Refrigerator.
- 5) Disconnect the Housing of lead wire.
- 6) Replace new one.
- 7) Assembly in reverse order of disassembly.
- 8) Replacement LED must be the same specification as original.



- Don't touch the LED, in case of light on the long time. Because it can be very hot.
- LED capacity is MAX 8W (GB7138**** MODEL : 6W).
- The LED will remain "ON" for 7minutes if the door is left open and then it is "OFF" for safety. (If you reopen the door, the lamp is "On".)

2. DOOR SWITCH

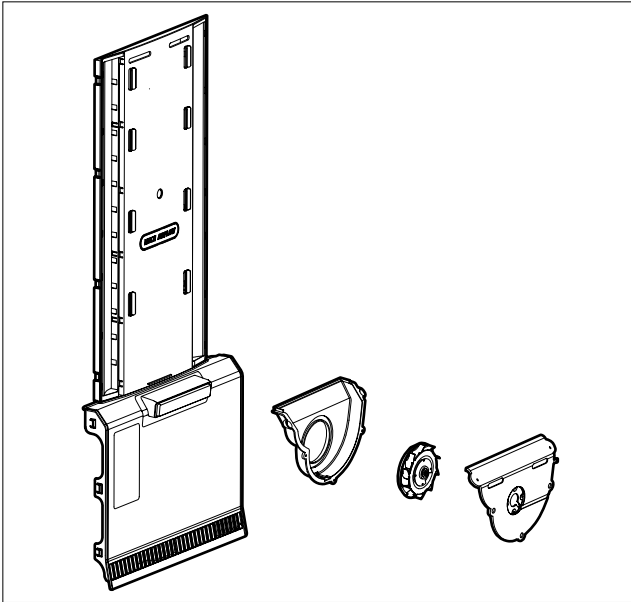
- 1) Unplug the power cord from the outlet.
- 2) Loosen six screws in upper part and disconnect Top Cover Front.
- 3) Disconnect Lead Wire from switch.
- 4) Disengage hook behind the switch by pressing it with hands.



4. FAN AND FAN MOTOR

1) Fridge

- 1) Remove all of the Fridge compartment.
- 2) Remove one screw in Case Assembly, Control REF.
- 3) Pull out the Case Assembly, Control REF.
- 4) Disconnect the Housing of lead wire.
- 5) Loose five screws fixed to the Bracket.
- 6) Pull out Bracket and then remove the Fan Motor Assembly.



2) Freezer

- 1) Remove all of the freezer compartment, (Involved wire shelf, ice maker)
 - 2) Remove two screws in Grille Fan.
 - 3) Pull out the Grille Fan and Shroud F.
 - 4) Disconnect the Housing of lead wire.
 - 5) Remove three screws in Grille Fan.
 - 6) Separate Shroud, F to the Grille Fan.
 - 7) Loose three screws fixed to the Bracket.
 - 8) Pull out Bracket and then remove the Fan Motor Assembly.
- ※ Fan Motor Assembly can't separate.

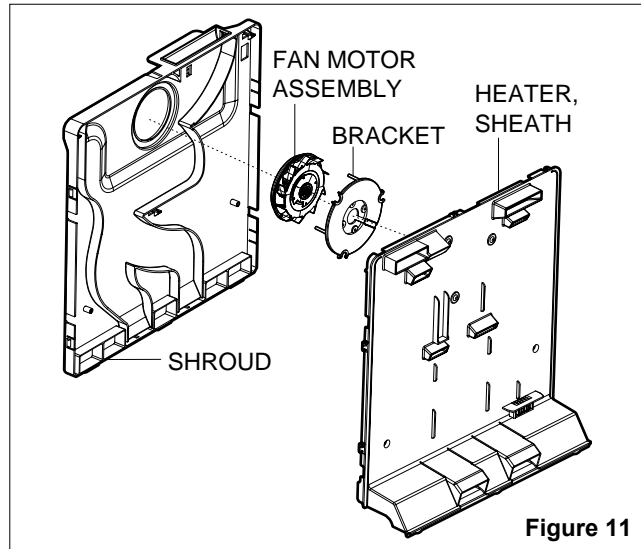


Figure 11

5. DEFROST CONTROL ASSEMBLY

Defrost Control Assembly consists of Thermistor and Fuse, Melting. Thermistor functions to defrost automatically and it is attached to metal side of the Evaporator and senses temperature.

Fuse, Melting is a kind of safety device for preventing overheating of the Heater when defrosting.

At the temperature of 77°C, it stops the emission of heat from the Heater.

- 1) Pull out the Shroud, F after removing the Grille.
 - Freezer
 - Pull out the Grille. - Fridge
- 2) Separate the connector connected with the Defrost Control Assembly and replace new one.

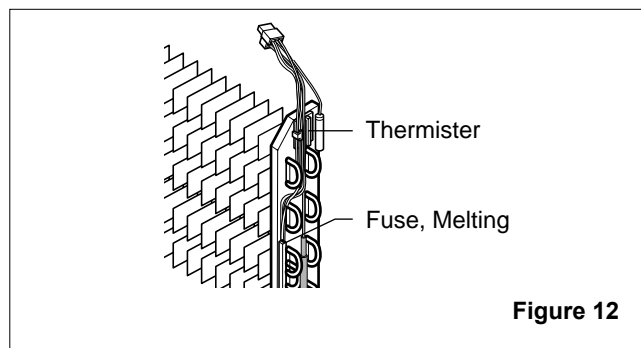
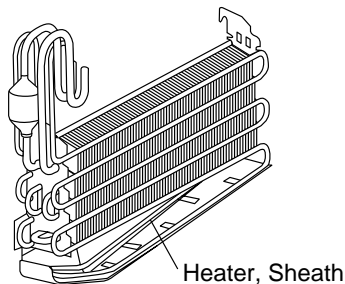


Figure 12

6. FRIDGE HEATER, SHEATH

In this refrigerator, Heater, Sheath is used for defrosting heater. During heating, the temperature of heater rises about 150~200°C. Therefore, be careful not to burn while servicing.

- 1) After removing the Grille and Shroud, separate the Heater, Sheath by disconnecting the connectors.
- 2) Exchanged Heater, Sheath and connected the housing.



7. FREEZER HEATER, SHEATH

In this refrigerator, Heater, Sheath is used for defrosting heater. During heating, the temperature of heater rises about 300~350°C. Therefore, be careful not to burn while servicing.

- 1) After removing the Grille and Shroud, separate the Heater, Sheath by disconnecting the connectors.
- 2) Exchanged Heater, Sheath and connected the housing.

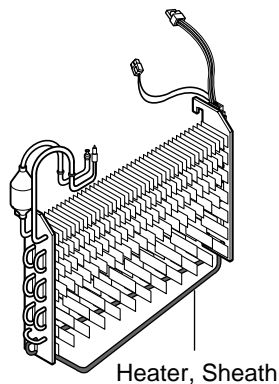
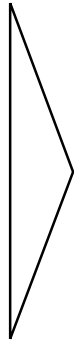


Figure 13

8. CASE ASSEMBLY PUMP DISASSEMBLY



Remove the basket over the case pump.



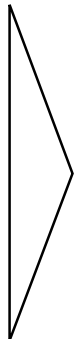
The dial rotated with open.



Remove the water tank.



Disassemble Screw.



Pull up the case pump.



Pull out each other and Disconnect the tubes.

● Check these when water is not supplied:

- 1) Check whether water is in the water tank.
- 2) Check whether you can hear the sound of pump working, when you push the dispenser button.
- 3) Check each connecting point of tubes.
(Water tank assembly, Case pump assembly)

Notice!

Pump may cause noise while water is being dispensed. This is due to remove the water inside tube for sanitation. When long period dose not use or the first use, you have to fill the water tank with over 1L water.

Caution :

Do not use other beverage (milk, juice, carbonated beverage etc) than potable water. Especially beverage including grain must not be used (may result in failure).

COMPRESSOR

1. Inverter Linear Compressor

Check for defect of the inverter linear compressor in following orders:

1) Method to Measure Compressor Winding Resistance

Normal Determination Criteria.

The compressor winding resistance can be determined as normal if resistance values show the values as described in below figure when measuring resistance values of the harness (connected with compressor) to connect.

Connect201(CON201) of the main PWB as shown in below figure.

Defect Determination Criteria

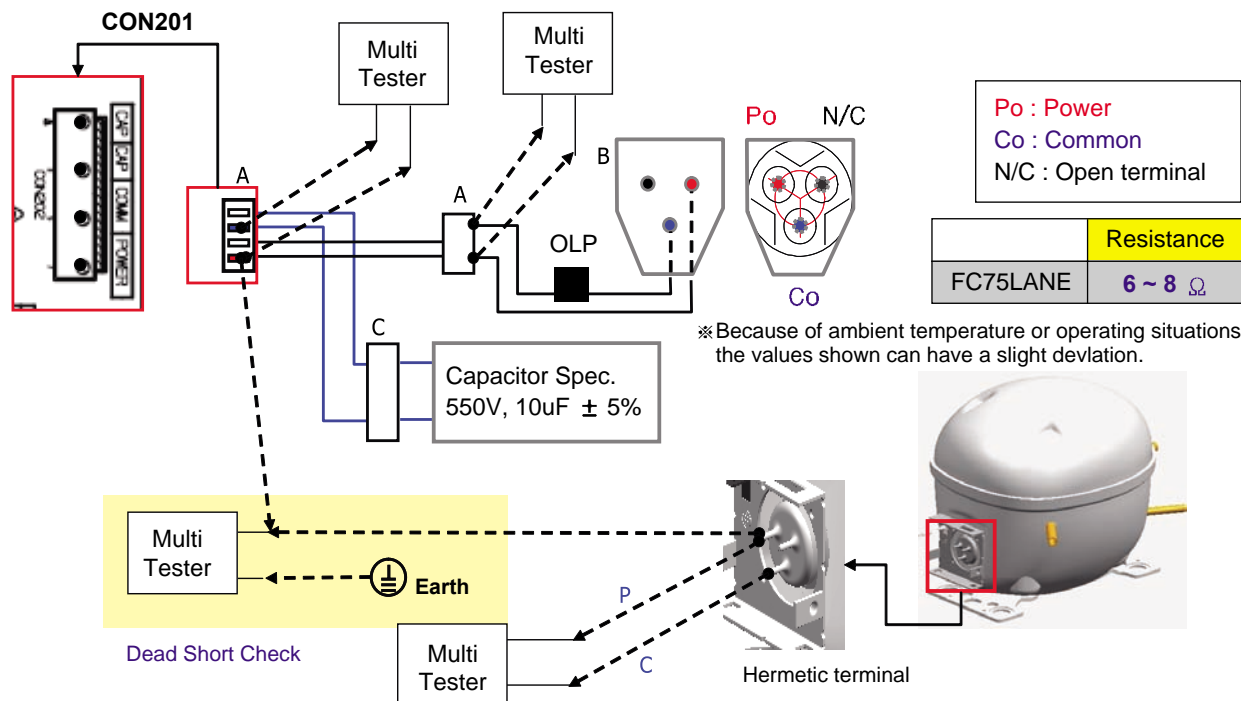
- Check connection status of the Compressor Connection Harness-P(Lead Wire) which is located at the M/C room where resistance values measured at the CON201 Housing are shown as infinite or several hundred $M\Omega$. Separate connecting wires of the M/C room (A-point in Figure) and then measure resistance values at the connecting wires again. The compressor can be determined as normal if resistance values are shown as standard resistance value. Check connection status of a harness.

Defect at M/C room connection contact or CON201 Housing contact, short-circuit of harness)

- Where resistance values measured at A-point are also shown as infinite or several hundred $M\Omega$, disassemble a cover PTC of the compressor terminal and check the terminal connecting status at the B-point in Figure.
- Where there is no failure in the wiring status and resistance values are shown as infinite or several hundred $M\Omega$, it may be determined as defect of compressor.
- Since if there is no failure in resistance values of the compressor, it may be defective Main PWB, replace the Main PCB and check for normal operation of the compressor.
- When determining any defect through resistance measuring, it can be determined as normal if resistance values show as described in the below figure by measuring ① power and ③ common terminal or ② full power and ③ common terminal. However, resistance values are measured when measuring ① power and ② full but measuring is meaningless since they cannot become criteria for determining defect (measuring not required).

Caution

1. Be sure to powering off the refrigerator and measure after several minutes has passed.
2. If not accurately measuring resistance, wrong determination may be guided. (Difference of resistance value of several W or so may occur.)



2) Method to Determine Defect of Inverter Linear Drive

Determination of Comp Operation

Separate the back cover at the rear of refrigerator and determine for possible operation while touching the compressor with the hands with insulation gloves worn.

Comp Operation

- Determine possible trip by checking operation status if cold air comes out after opening the doors of the R-Room.

Protective Logic (Trip)

- To protect the compressor from abnormal operation, this logic is used to temporally stop the refrigerator when abnormal operation occurs and to re-operate it after abnormal signal disappears.

Compressor protection Logic Table

	App.	Requirement	Waiting Time	The number of LED blinking
Stroke Trip	E-Inv.	Piston overruns the designed range.	1' 00"	2
Locked Piston Trip	E-Inv.	Piston is locked.	2' 30"	5
Current Trip	E-Inv.	Current overruns the designed range	6' 00"	6
IPM Fault	E-Inv.	IPM pin 14 output voltage = low (IPM Short, High current input, or low voltage input)	20"	7

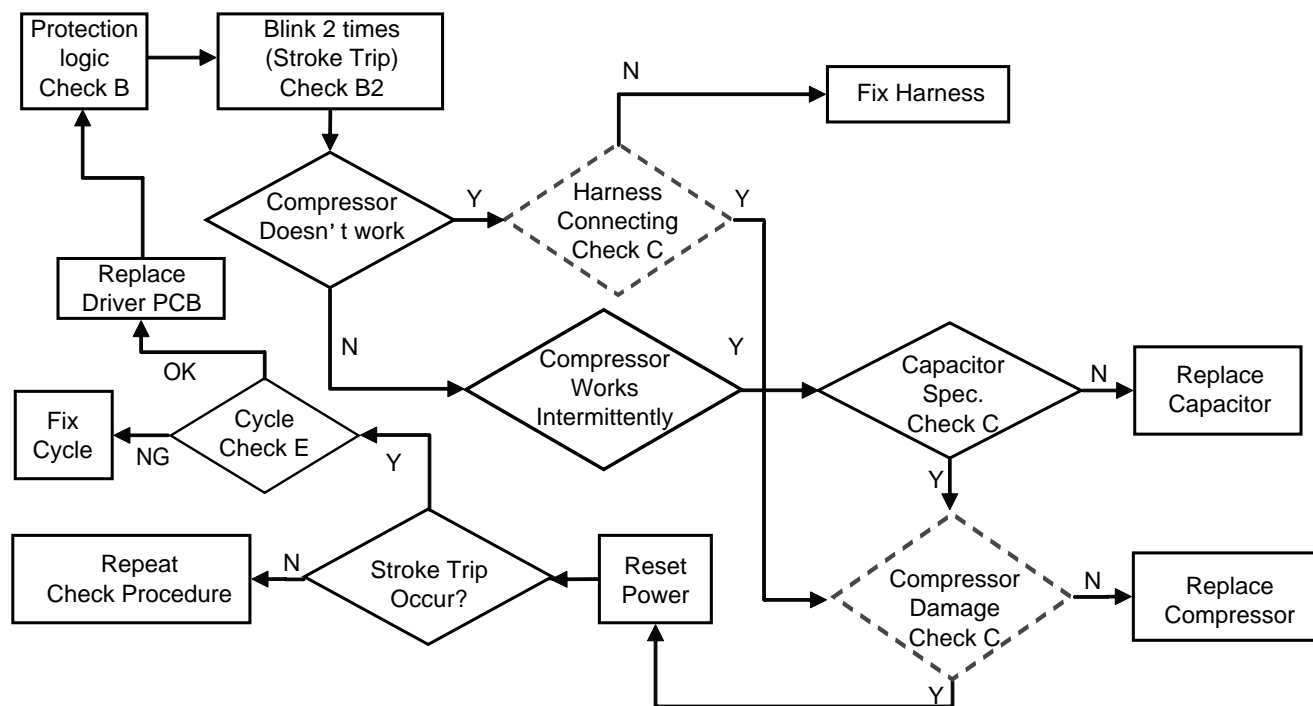
※ If LED of PCB is blinking, Refer to next page.

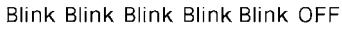
3) LED blinks two times, then repeats (Stroke Trip)



Blink Blink OFF Blink Blink OFF

- Purpose: Prevent abnormally long piston strokes.
- Case 1. If compressor doesn't work and LED blinks
 - Cause: Possibly harness from compressor to PCB might be defective.
- Case 2. If compressor works intermittently and LED blinks
 - Cause: Condenser Fan or Freezer Fan is not running. Sealed system problem such as moisture restriction, restriction at capillary tube or refrigerant leak.
- Logic: Compressor is forced to off and then tries to restart after 1 minute.



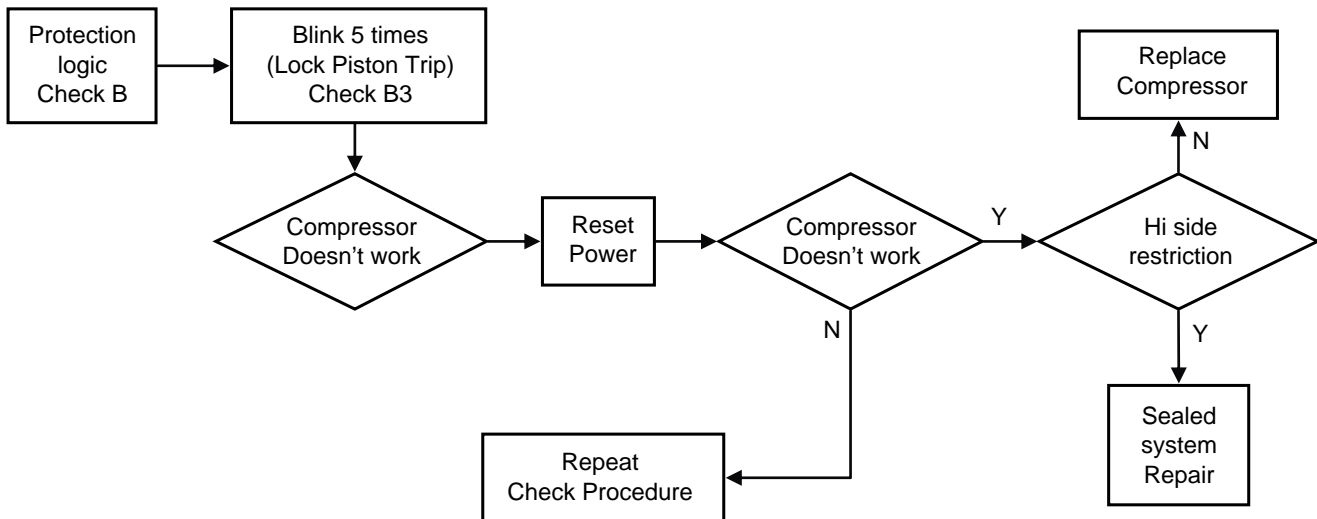


→ Purpose: To detect locked piston

→ Cause: Lack of oil to the cylinder, cylinder or piston damaged and or restricted discharge.

A Locked Piston can also be caused by foreign materials inside the compressor.

→ Logic: Compressor is forced off and tries to restart within 2.5 minutes.

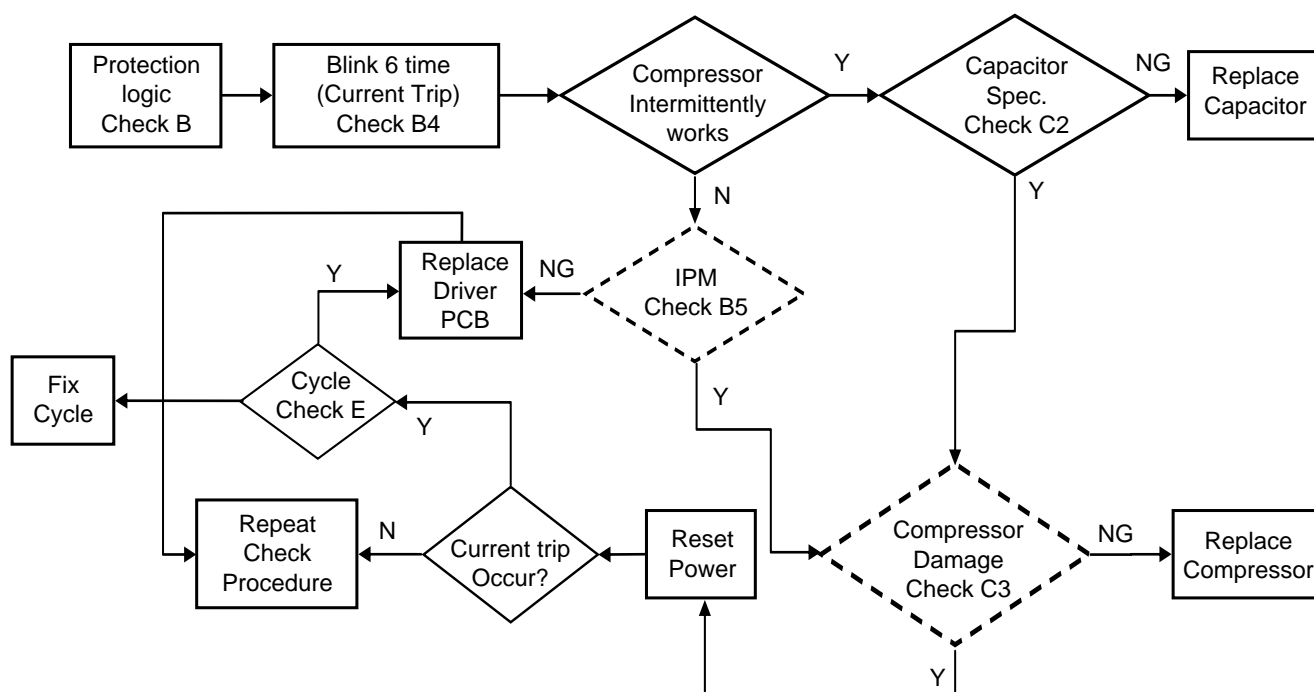


5) LED blinks six times, then repeats (Current Trip)



Blink Blink Blink Blink Blink Blink OFF

- Purpose: Prevent over-current (overload protect)
- Cause: Ambient temperature is high (over 43°C) and/or refrigerator's condenser air movement is restricted.
- Condenser Fan is stopped, restricted discharge line, compressor is damaged, or IPM device is defective.
- Logic: Compressor is forced off and tries to restart after 2.5 minutes.

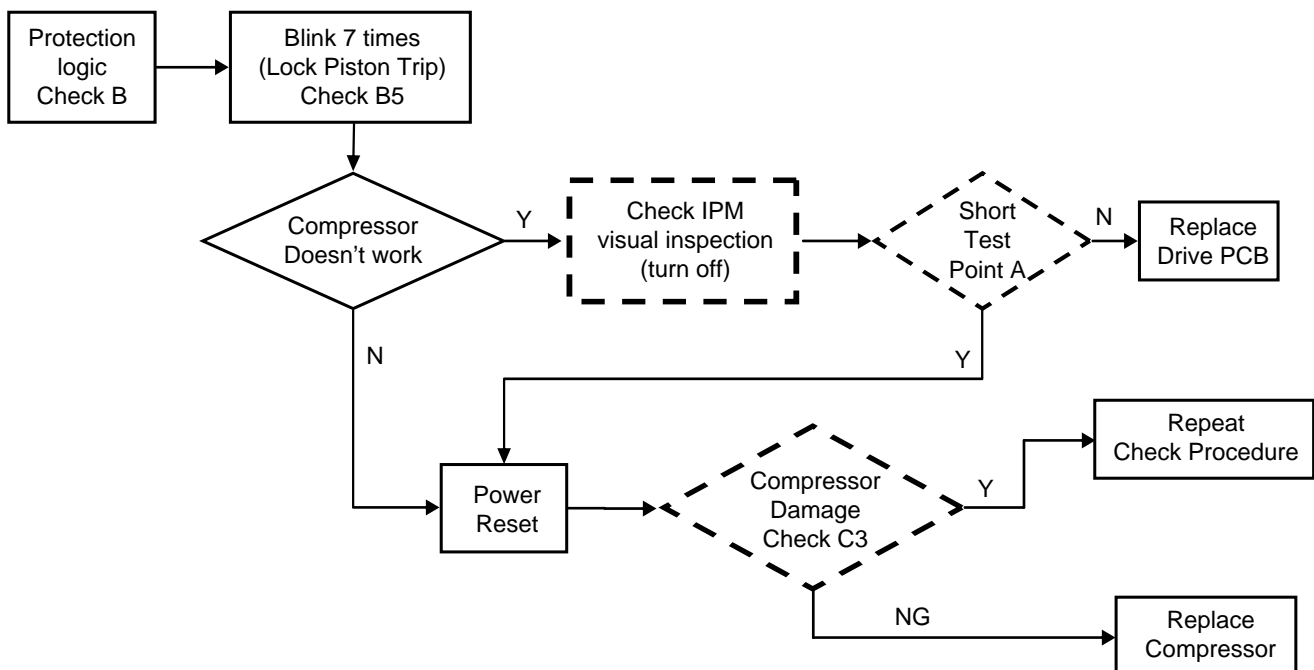
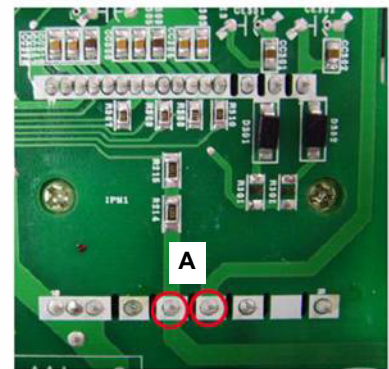
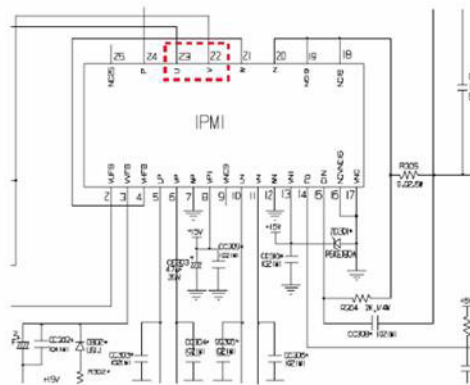
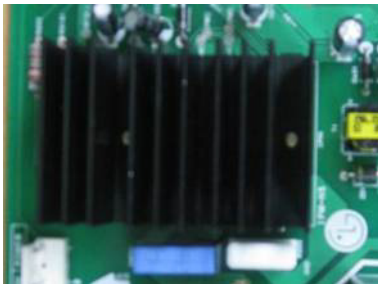


6) LED blinks seven times, then repeats (IPM Fault)



Blink Blink Blink Blink Blink Blink Blink OFF

- Purpose: Prevent high current due to IPM Short
- Cause: Damaged IPM (Dead Short)
- Test for a dead short at **Point A** with a VOM.
- Logic: Compressor is forced off and tries to restart in 2.5 minutes.



Heavy Repair Method of Refrigerator by Application of Refrigerant

1. Outline

1) Checkpoints before Heavy Repair

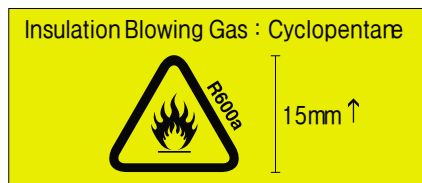
Open the Cover ASM, Back-M/C of refrigerator and check the type of refrigerant indicated on a compressor before starting work. A yellow label is adhered to the compressor for the refrigerator using R600a as refrigerant.

2) Features of R600a Refrigerant

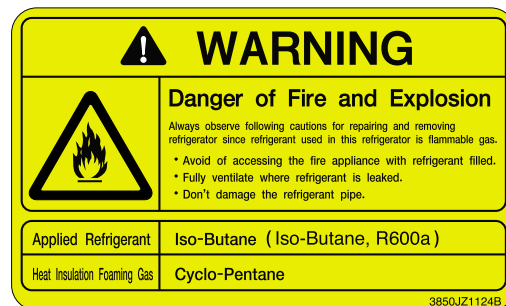
- Non-polar natural gas refrigerant ($\text{CH}(\text{CH}_3)_3$)
- Since R600a is same series as butane gas, there is danger of fire when discharged into air at appropriate concentration (extreme handling is required for heavy repair of cycle).
Explosion concentration: .8% ~ 8.4%/Vol.
Burning temperature: 494°C

3) Features of R600a Refrigerant

- With refrigerant quantity of 60% or so for the refrigerator using R134a as refrigerant
- Large vacuum level at suction pressure (at low pressure side)
- COMP capacity of the refrigerator using R609a as refrigerant is large by 1.7 times than that of the refrigerator using R134a.
- Labels as in Figure are displayed at the compressor of a refrigerator for R600a and the back plate of refrigerator.



[Warning sign according to ISO 3864]



4) Location and Environment for Heavy Repair

- Check that drafting and air ventilation are well done at a working area and perform work after making drafting and air ventilation smooth (use refrigerant return bag indoors).
- Check that there are fire appliances or heating source around the working area and then remove them before work.
- Since R600a refrigerant is very inflammable, they should not be discharged indoors.
- Be sure to follow heavy repair SVC procedures during work.

5) Heave Repair Work Tool

- R600a refrigerant
- Bombe
- Pinch Pliers
- Refrigerant Discharge Hose
- Refrigerant Return Bag
- Vacuum Pump
- Handy Welding Machine
- Charging Tube
- Leakage Tester
- Drier

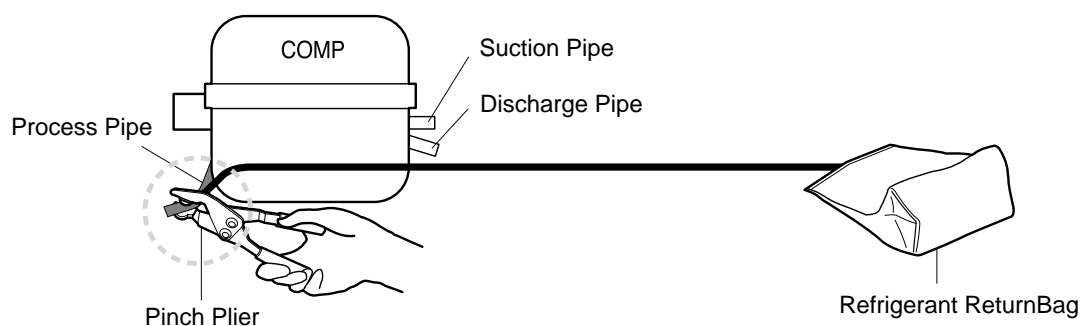
2. Heavy Repair SVC Method

For the heavier repair of R600a type of refrigerator, perform work according to following SVC method.

1) Return of Refrigerator Refrigerant

Required equipment: Pinch pliers, refrigerant discharging hose, refrigerant return bag

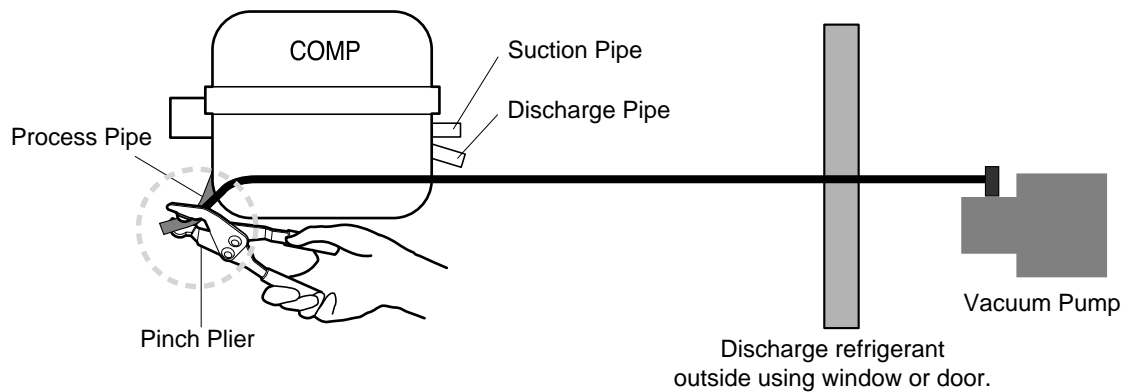
- Take power cords out and remove power between 6sec through 12sec after powering ON to open all both sides of 3way valve.
- Leave doors of a refrigerator so that they are not closed.
- Connect pinch pliers with a refrigerant discharging hose.
- Place the outlet of a refrigerant discharging hose outside.
(Remove fire appliances or heating sources near a refrigerant discharging hose.)
- Always use a refrigerant return bag for working at the contained space.
- Bore the charging pipe of a compressor with pinch pliers.
(Remove fire appliances or heating sources near a refrigerator.)
- Perform refrigerant discharge for more than 7 minutes.



2) Return of Remained Refrigerant

Required equipment: Pinch pliers, hose for refrigerant recovery, vacuum pump

- If refrigerant return time of 7 minutes has passed, connect a vacuum pump at the ends of a refrigerant return hose outdoor. (Vacuum pump must operate outdoor.)
- Operate a vacuum pump in order to return refrigerant remained in the pipe.
- Vacuum working time should be for more than 10 minutes.



3) Welding Repair Step

Required equipment: Simple welding machine

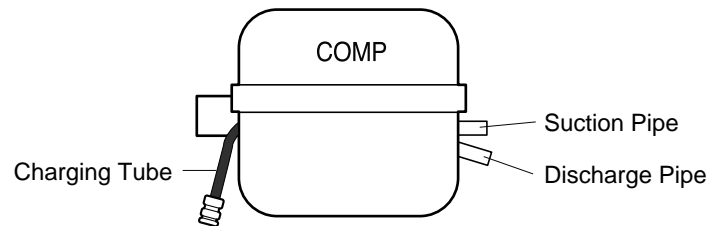
- Remove pinch pliers if remaining refrigerant return is completed.
- Cut the front part of a process pipe with a cutter. (Check that remaining refrigerant comes out.)
- Perform welding work such as replacement of compressor and dryer, or repair of leakage part. (Be cautious of fire during welding work.)



4) Charging Tube Connection Step

Required equipment: Charging tube, simple welding machine

- Remove a charging pipe to recharge R600a refrigerant after completing work, and then connect a charging tube with welding



5) Vacuum Air Removal

Required equipment: Vacuum pump

- Connect a vacuum pump to a charging tube to perform vacuum cycle.
- Vacuum work should be performed for an hour. (If vacuum time is short, normal cooling performance may not be exerted due to failure of cooling cycle.)



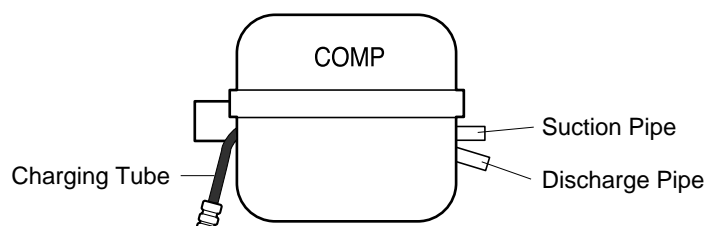
6) Refrigerant Charging

Required equipment: Bombe, R600a refrigerant (73g)

- Firstly remove fire appliances and heating source for performing work when charging scaled refrigerant. (Do not spray refrigerant indoor.)
- Measure the accurate quantity (73g) of refrigerant to charge it into a Bombe.
- Make the Bombe as vacuum status to charge refrigerant.
(If there is air or moisture in a Bombe, it may give effect on performance of a cooling cycle.)
- Please manage refrigerant quantity as $73g \pm 1$. Differently from R134a, R600a gives much effect on cooling performance depending on change of refrigerant quantity.

Refrigerant quantity = Weight after charging - Weight before charging (weight of vacuumed Bombe)

- Connect Bombe with a charging tube to charge refrigerant.
- Turn on power of refrigerator to operate a compressor.
- Measure Bombe weight after 5 through 10 minutes to check remained refrigerant quantity to complete charging of refrigerant.
(After charging refrigerant, never perform welding work or work using fire appliances.)

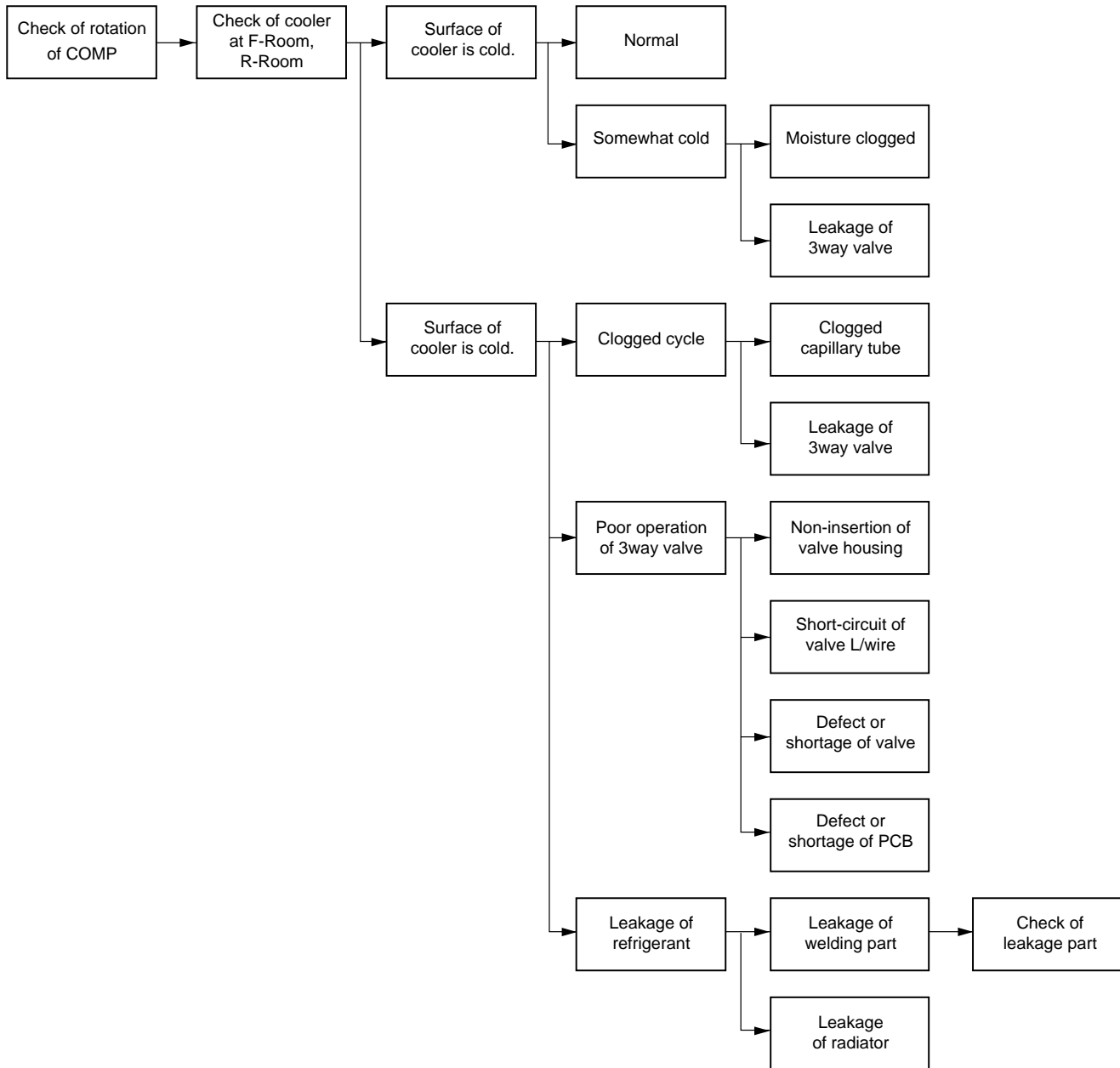


7) Leak Inspection and Cycle Check

Required equipment: Leakage checking machine (foam and leakage inspection machine)

- Check for leakage by using foam or a leakage inspection machine at the worked part if charging of refrigerant is completed.
- Check for leakage at the low pressure part with the compressor stopped, and check at the high pressure part with the compressor being operating.
- If leakage is detected, proceed to repair according to repair process again starting from "2-1. Return of Refrigerator Refrigerant".
(Never perform welding work or work using fire appliances.)
- Check that heat remains at a discharge pipe or condenser with the hands if leakage check is completed. If heat remains, the cooling cycle is normal.
(Take care since a discharge pipe may be hot.)

8) Failure Checking Procedures



9) Cautions in Heavy Repair Service

Special caution should be taken since fire may occur for welding work since refrigerant may remain as it is at the high pressure side even after vacuum air-discharge in relation with cycle clogging. Take power cords out and remove power between 6sec - 12sec after powering on in order to open both sides of 3way valve in the step of refrigerant recovery. If both sides of 3way valve will not be opened, fire may occur during welding work since refrigerant may remain during the cycle. To prevent moisture clogging, always replace dryer together during heavy repair of refrigerator.

3-Way Valve Service

- Since 3-way valve controls refrigerant with an inner plastic damper, defect may occur because the plastic damper is deteriorated and welding heat is delivered to a pipe during welding for repair and replacement of the valve welding part.

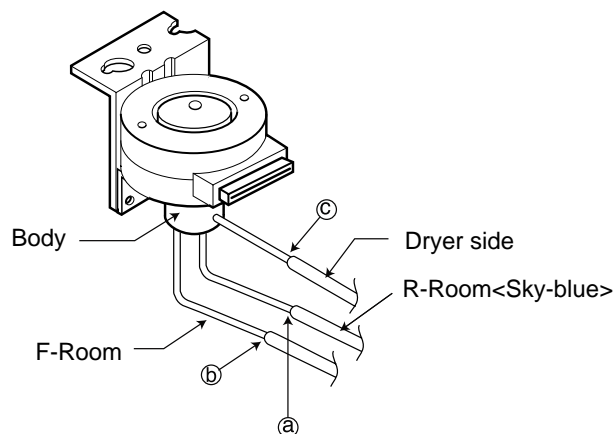
So perform service in following service method.

- 1) Replace 3way valve ASSY where refrigerant leakage occurs at the joint pipe (a, b, c part) connected with the service valve of valve welding part.

(For unavoidable welding, wrap the body part of valve with a water towel so that delivery of welding heat is minimized (100°C or less).

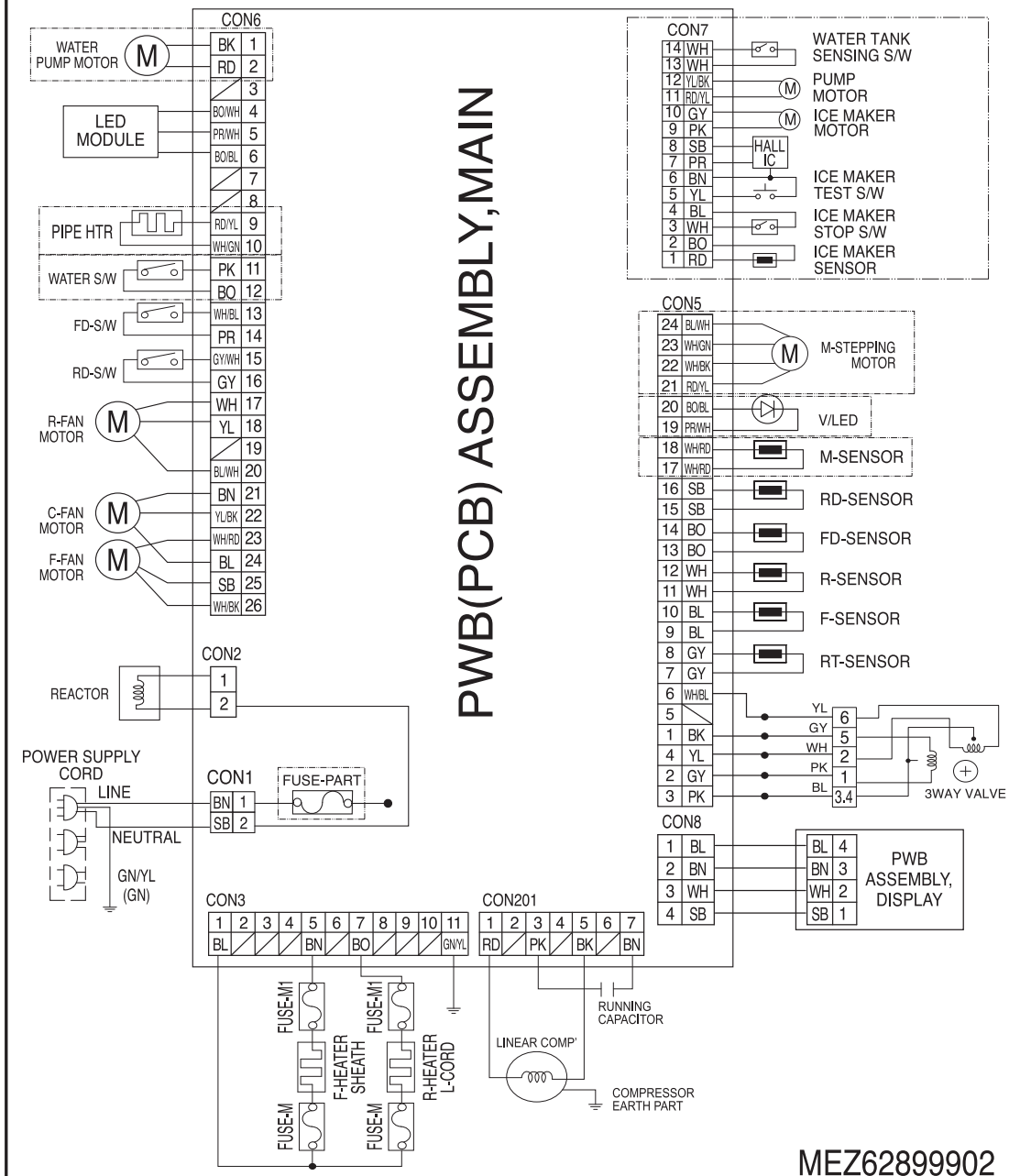
- 2) Service in replacement of valve (valve failure)
Perform service in the same method as above.
- 3) Other cautions

- (1) Pipe for capillary tube should be welded through insertion by 20+3-3mm. (For preventing clogging during welding)
- (2) Take care since inner ejecting objects may be damaged if falling a valve or giving a strong shock. (Poor operation and leakage quantity may be increased due to damage of inner parts.)
- (3) Entirely remove and check ice formation which occurred in Eva before or after improvement work for non-insertion of 3-way valve housing, defect or shortage of goods, defective welding.



CIRCUIT DIAGRAM

CIRCUIT DIAGRAM



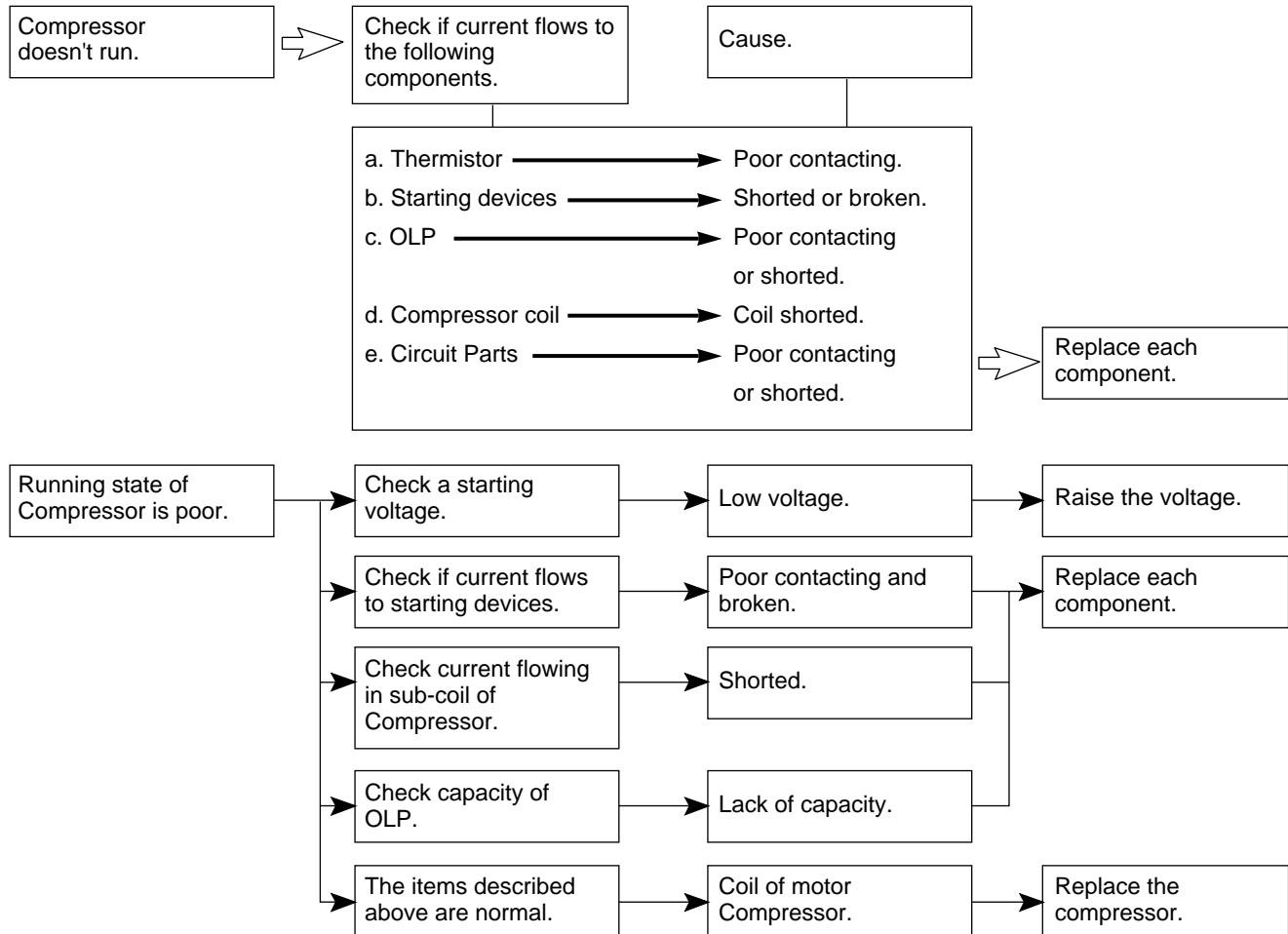
• THE PLUG TYPE, CAPACITOR PART, VEGETABLE LED PART, COMPRESSOR, ICE MAKER PART, COMPRESSOR EARTH PART, M-ROOM PART, DISPENSER PART, FUSE PART, FUSE-M1 ON CIRCUIT DIAGRAM ARE SUBJECTED TO CHANGE IN DIFFERENT LOCALITIES AND ACCORDANCE WITH MODEL TYPE.

BK:BLACK	RD:RED	BO:BRIGHT ORANGE	GN:GREEN	WH/RD : WHITE/RED	BL/WH : BLUE/WHITE
BL:BLUE	GY:GRAY	SB:SKY BLUE	PK:PINK	BK/YL : BLACK/YELLOW	YL/BK : YELLOW/BLACK
BN:BROWN	PR:PURPLE	YL:YELLOW	WH:WHITE	BK/WH : BLACK/WHITE	PR/WH : PURPLE/WHITE
BO/BL : BRIGHT ORANGE/BLUE	GY/WH: GRAY/WHITE	WH/BL : WHITE/BLUE	WH/GN : WHITE/GREEN	RD/YL : RED/YELLOW	WH/GN:WHITE/GREEN
	WH/BK:WHITE/BLACK		GN/YL:GREEN/YELLOW		

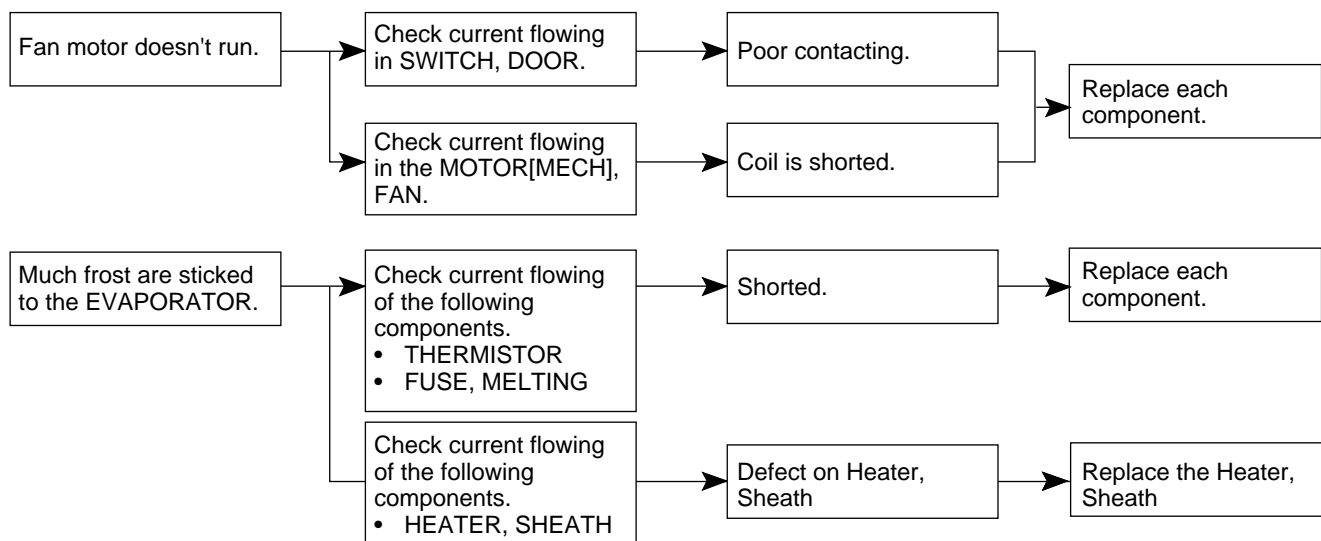
TROUBLESHOOTING (Mechanical Part)

1. ANOTHER ELECTRIC COMPONENTS

▼ Cooling is impossible



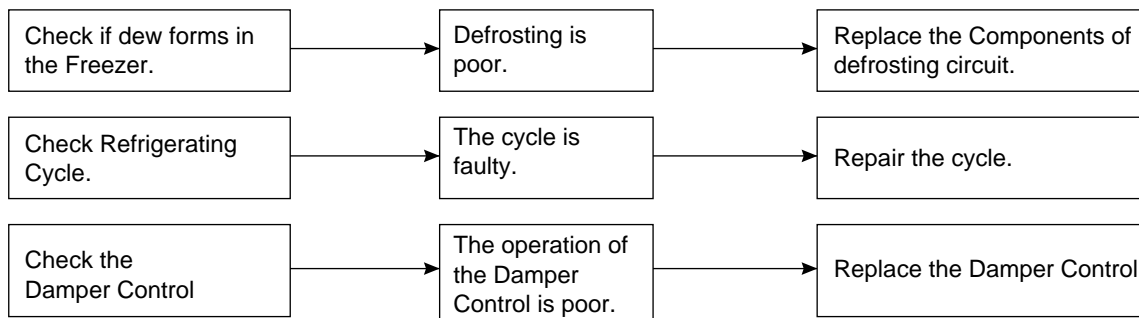
▼ Cooling ability is poor



2. SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
Cooling is impossible.	<ul style="list-style-type: none"> ● Is the power cord unplugged from the outlet? ● Check if the power switch is set to OFF. ● Check if the fuse of power switch is shorted. ● Measure the voltage of power outlet. 	<ul style="list-style-type: none"> ● Plug to the outlet. ● Set the switch to ON. ● Replace a regular fuse. ● If voltage is low, wire newly.
Cooling ability is poor.	<ul style="list-style-type: none"> ● Check if the set is placed close to wall. ● Check if the set is placed close to stove, gas cooker and direct rays. ● Is the ambient temperature high or the room door closed? ● Check if put in is hot. ● Did you open the door of the set too often or check if the door is closed up? ● Check if the Damper Control is set to "cold-position". 	<ul style="list-style-type: none"> ● Place the set with the space of about 10cm. ● Place the set apart from these heat appliances. ● Make the ambient temperature below. ● Put in foods after cooled down. ● Don't open the door too often and close it firmly. ● Set the control to mid-position.
Foods in the Refrigerator are frozen.	<ul style="list-style-type: none"> ● Is foods placed in cooling air outlet? ● Check if the control is set to "cold-position". ● Is the ambient temperature below 5°C? 	<ul style="list-style-type: none"> ● Place foods in high temperature section. (Front Part) ● Set the control to "mid-position". ● Set the control to "warm-position".
Dew or ice forms in the chamber of the set.	<ul style="list-style-type: none"> ● Is liquid food stored? ● Check if put in is hot. ● Did you open the door of the set too often or check if the door is closed up. 	<ul style="list-style-type: none"> ● Seal up liquid foods with wrap. ● Put in foods after cooled down. ● Don't open the door too often and close it firmly.
Dew forms in the Exterior Case.	<ul style="list-style-type: none"> ● Check if ambient temperature and humidity of surrounding air are high. ● Is there gap in the door packed? 	<ul style="list-style-type: none"> ● Wipe dew with a dry cloth. This occurrence is solved naturally in low temperature and humidity. ● Fill up the gap.
Abnormal noise generates.	<ul style="list-style-type: none"> ● Are the set positioned in a firm and even place? ● Are any unnecessary objects set in the back side of the set? ● Check if the Tray Drip is not firmly fixed. ● Check if the cover of mechanical room in below and front side is taken out. 	<ul style="list-style-type: none"> ● Adjust the Adjust Screw, and position in the firm place. ● Remove the objects. ● Fix it firmly on the original position. ● Place the cover at the original position.
To close the door is not handy.	<ul style="list-style-type: none"> ● Check if the door packing is dirty with filth such as juice. ● Is the set positioned in a firm and even place? ● Is too much food putted in the set? 	<ul style="list-style-type: none"> ● Clean the door packing. ● Position in the firm place and adjust the Adjust Screw. ● Keep foods not to reach the door.
Ice and foods smell unpleasant.	<ul style="list-style-type: none"> ● Check if the inside of the set is dirty. ● Did you keep smelly foods without wrapping? ● It smells of plastic. 	<ul style="list-style-type: none"> ● Clean the inside of the set. ● Wrap smelly foods. ● The new products smells of plastic, but it is eliminated after 1-2 weeks.

- In addition to the items described left, refer to the followings to solve the complaint.



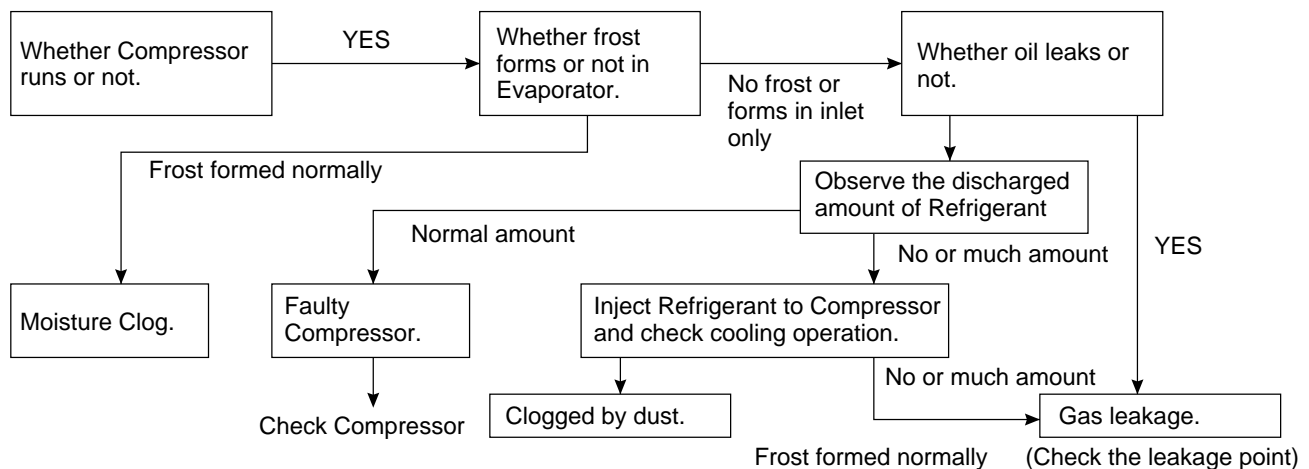
3. REFRIGERATING CYCLE

▼ Troubleshooting Chart

CAUSE		STATE OF THE SET	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer room and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only	A little high more than ambient temperature.	<ul style="list-style-type: none"> ● A little Refrigerant discharges. ● Normal cooling is possible when injecting of Refrigerant the regular amount.
	WHOLE LEAKAGE	Freezer room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> ● No discharging of Refrigerant. ● Normal cooling is possible when injecting of Refrigerant the regular amount.
CLOGGED BY DUST	PARTIAL CLOG	Freeze room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high more than ambient temperature.	<ul style="list-style-type: none"> ● Normal discharging of refrigerant. ● The capillary tube is faulty.
	WHOLE CLOG	Freezer room and Refrigerator don't cool.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> ● Normal discharging of Refrigerant.
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of Refrigerant is not heard and frost melts.	Low than ambient temperature	<ul style="list-style-type: none"> ● Cooling operation restarts when heating the inlet of capillary tube.
DEFECTIVE COMPRESSION	COMP-RESSION	Freezer and Refrigerator don't cool.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high than ambient temperature.	<ul style="list-style-type: none"> ● The pressure of high pressure part in compressor is low.
	NO COMP-RESSION	No compressing operation.	Flowing sound of Refrigerant is not heard and no frost.	Equal to ambient temperature.	<ul style="list-style-type: none"> ● No pressure of high pressure part in the compressor.

▼ Leakage Detection

- Observe discharging point of refrigerant which may be in the oil discharging part in the compressor and hole of evaporator.



▼ General Control of Refrigerating Cycle

NO.	ITEMS	CONTENTS AND SPECIFICATIONS	REMARKS
1	WELDING ROD	(1)H 30 <ul style="list-style-type: none"> Chemical Ingredients Ag : 30%, Cu : 27%, Zn : 23%, Cd : 20% Brazeing Temperature : 710~840°C (2)Bcup-2 <ul style="list-style-type: none"> Chemical Ingredients Cu : About 93% P : 6.8~7.5% The rest : within 0.2% Brazeing Temperature : 735~840°C 	<ul style="list-style-type: none"> Recommend H34 containing 34% Ag in the Service Center.
2	FLUX	<ul style="list-style-type: none"> Ingredients and how to make Borax 30% Borax 35% Fluoridation kalium : 35% Water : 4% Mix the above ingredients and boil until they are transformed into liquid. 	<ul style="list-style-type: none"> Make amount for only day. Holding period : 1 day Close the cover of container to prevent dust putting in the FLUX. Keep it in a stainless steel container.
3	LOKRING (Figure 23, 24)	(1)Both of the tube is inserted up to the stop. (2)Both of the LOKRING is pushed up to the stop (3)The bending point is not too close to the joint ending. (4)During the assembly it is important that both ends remain completely within the joint.	<ul style="list-style-type: none"> For a hermetically sealed metal/metal connection, the tube ends have to be clean. LOKPREP is distributed all of out-surface of the tube ends.
4	DRIER ASM	(1)Assemble the drier within 30min. after unpacking. (2)Keep the unpacked drier at the temperature of 80~100°C.	<ul style="list-style-type: none"> Don't keep the drier in a outdoors because humidity damages to it.
5	VACUUM	(1)When measuring with pirant Vacuum gauge the charging M/C, vacuum degree is within 1 Torr. (2)If the vacuum degree of the cycle inside is 10 Torr. below for low pressure and 20 Torr. for high pressure, it says no vacuum leakage state. (3)Vacuum degree of vacuum pump must be, 0.05 Torr. below after 5 min. (4)Vacuum degree must be same to the value described item above for more than 20 min.	<ul style="list-style-type: none"> Apply M/C Vacuum Gauge without fail. Perform vacuum operation until a proper vacuum degree is built up. If a proper vacuum degree isn't built up, check the leakage from the Cycle Pipe line part and Quick Coupler Connecting part.
6	DRY AND AIR NITROGEN GAS	(1)The pressure of dry air must be more han 12~16kg/cm ² (2)Temperature must be more than -20~-70°C. (3)Keep the pressure at 12~6kg/cm ² also when substituting dry air for Nitrogen Gas.	
7	NIPPLE AND COUPLER	(1)Check if gas leaks with soapy water. (2)Replace Quick Coupler in case of leakage.	<ul style="list-style-type: none"> Check if gas leaks from joint of the Coupler.
8	PIPE	<ul style="list-style-type: none"> Put all Joint Pipes in a clean box and cover tightly with the lid so that dust or humidity is not inserted. 	

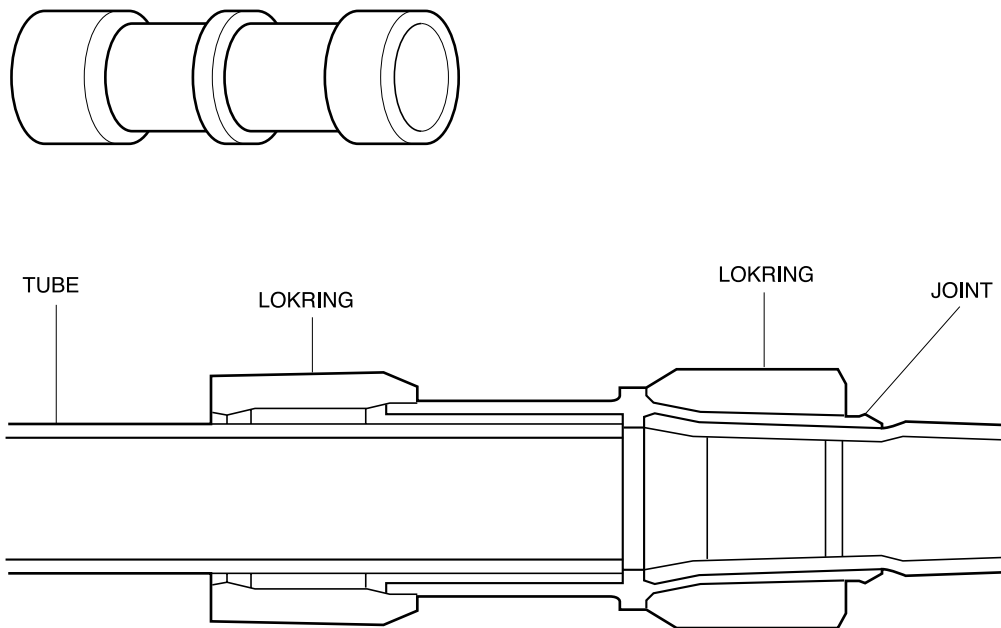


Figure 23. LOKRING

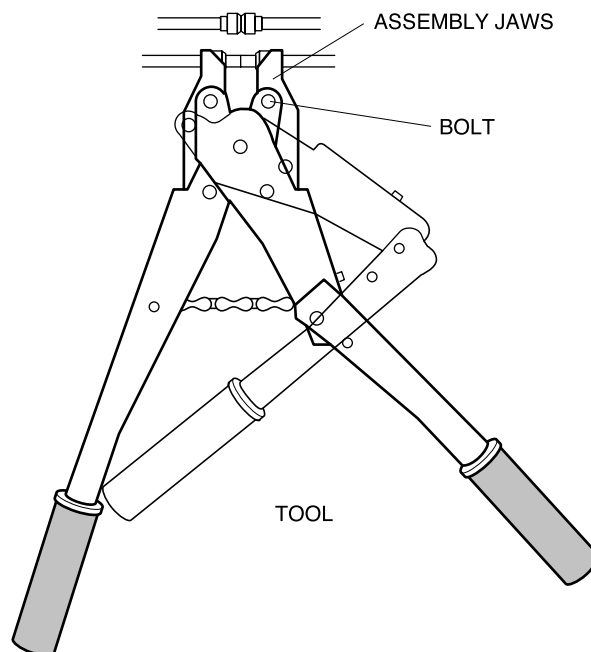


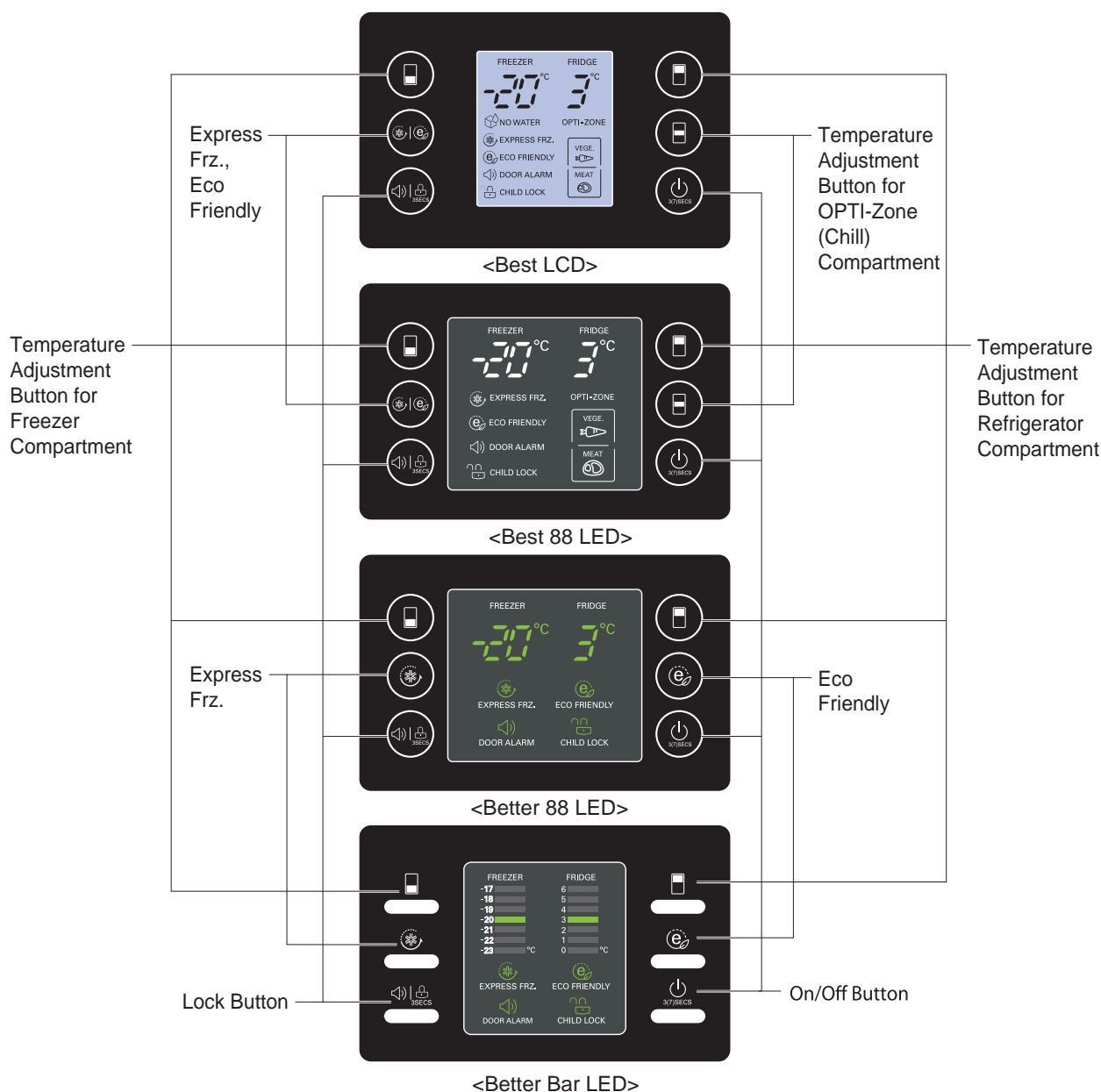
Figure 24. LOKRING TOOL

MICOM FUNCTION & PCB CIRCUIT EXPLANATION

1. FUNCTION EXPOSITION

1) FUNCTION

- (1) When the appliance is plugged in, it is set to 3°C for the Refrigerator and -20°C for the Freezer. You can adjust the Refrigerator and the Freezer control temperature by pressing the FRZ. Temp button or REF. Temp button.
- (2) When the power is initially applied or restored after a power failure, it is automatically set to $3^{\circ}\text{C}/-20^{\circ}\text{C}$.

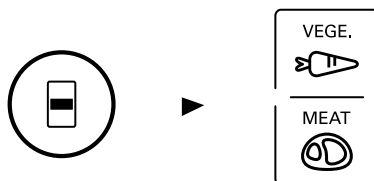


● Display Power saving Mode

The display is always OFF without Lock Icon (saving mode), until door is opened or display button is pressed. When 20 seconds has elapsed after closing door or pressing button, the display turns OFF without Lock.

2) Chill compartment (Optional)

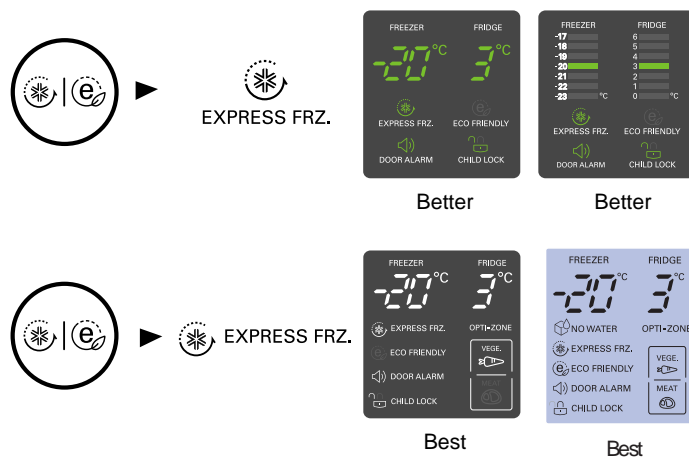
- By pressing the button, store vegetables, fruits (at relatively low conservation temperature) or other types of food such as meat to be defrosted.
- **Method to Use :**
You can select optimum temperature range depending on types of food stored.



- 2 Step of temperature selection including vegetables, Fruits (2°C) and meat and fish (-1°C) is available.
- Vegetable and cold storage foods requiring humidity Maintenance and meats/fishes can be more freshly stored depending on type of foods stored.
- When "VEGE." button's lamp is taken on, opti-zone is to chill compartment.
- Chill compartment' temperature is maintained within -2°C ~ 3°C regardless of ambient temperature. Chill compartment is the special temperature zone.

3) Express Frz.

- Please select this function for prompt freezing.
- This function is used when you want to freeze the foods quickly. Press the Express Frz. button once, and then the quick freeze operation starts with the lamp on.
- The Express Frz. operation takes about 3 hours. When its operation ends, it automatically returns to the previous temperature setting. If you want to stop the quick freeze operation, press the Express Frz. button once more, the lamp goes out, and the Express Frz. operation stops and the refrigerator returns to the previous temperature setting.

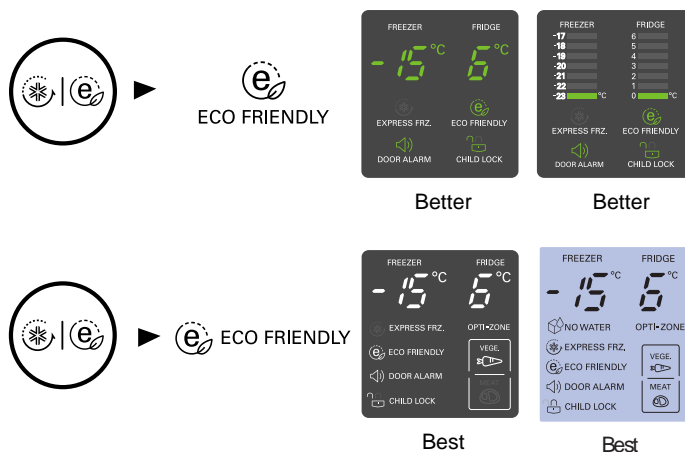


- The arrow mark graphic remains at the on status after flickering for 4 times when selecting Express Frz. is turned "On".

4) Eco Friendly

This function makes the fridge-freezer work in a power saving mode which is useful for when you are away on holiday, by reducing energy consumption.

Pressing 'ECO FRIENDLY' starts operation with lamp on and pressing it again stops the operation.



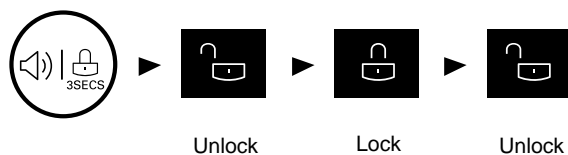
NOTE :

When the Eco Friendly mode is "ON", the other buttons will not operate. When you come back from Eco Friendly, press the Eco Friendly mode off so that other buttons work and the refrigerator returns to previous temperature setting.

5) Lock

For LED Model

- Pressing this button stops operation of other buttons.
- "Locking" or "Un-Locking" is repeated whenever pressing the LOCK button.
(For "Locking" press the "LOCK" button for 3 sec. For "Un-Locking" press the "LOCK" button for 3 sec.)
- When 'LOCK' is activated, pressing the other buttons would not work.



6) Power On/Off

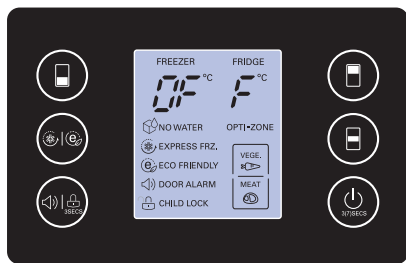
- Pressing this button refrigerator power is ON or OFF.
- ON or OFF is repeated whenever pressing the ON/OFF button.
(For "OFF" press the "ON/OFF" button for 7 sec. For "ON" press the "ON/OFF" button for 1 sec.)

7) Door Alarm Buzzer Mute Mode

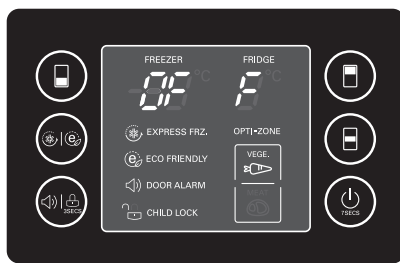
- Press ALARM/LOCK to turn the buzzer on or off.

8) Exhibition(Demo) Mode

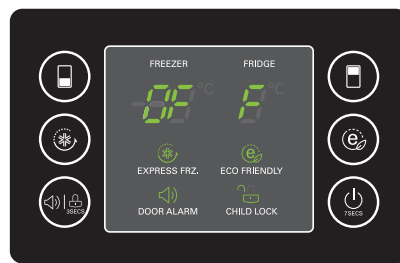
- Demo mode is available for displaying the refrigerator in a sales setting or similar condition.
- It allows the display, dispenser, and lights to operate without running the compressor and fan.
- To apply the DEMO mode, open the door and press and hold the REFRIGERATOR and EXPRESS FRZ. buttons simultaneously for 5 second.
- To exit the DEMO mode and return to normal operation, press and hold the REFRIGERATOR and EXPRESS FRZ. for 5 second.



Best



Best

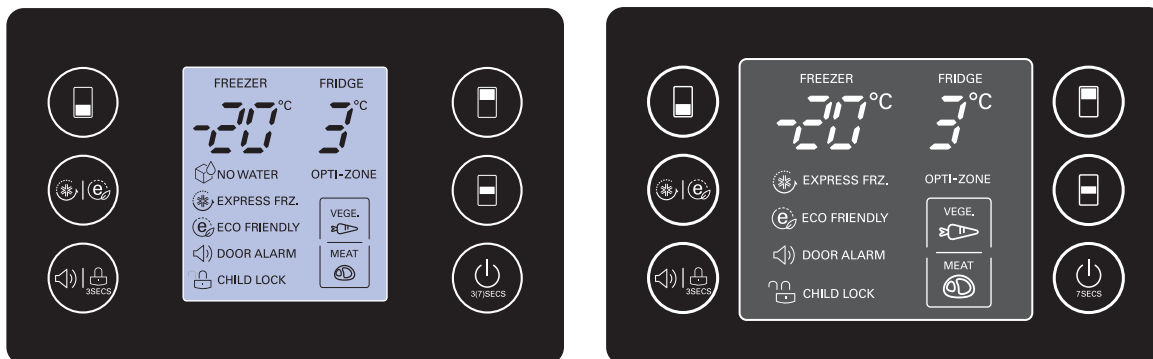


Better



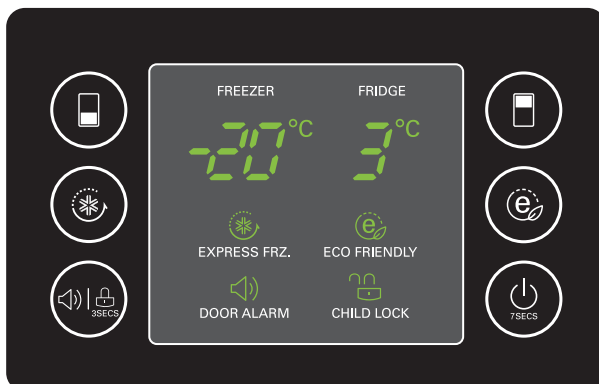
Better

► BEST



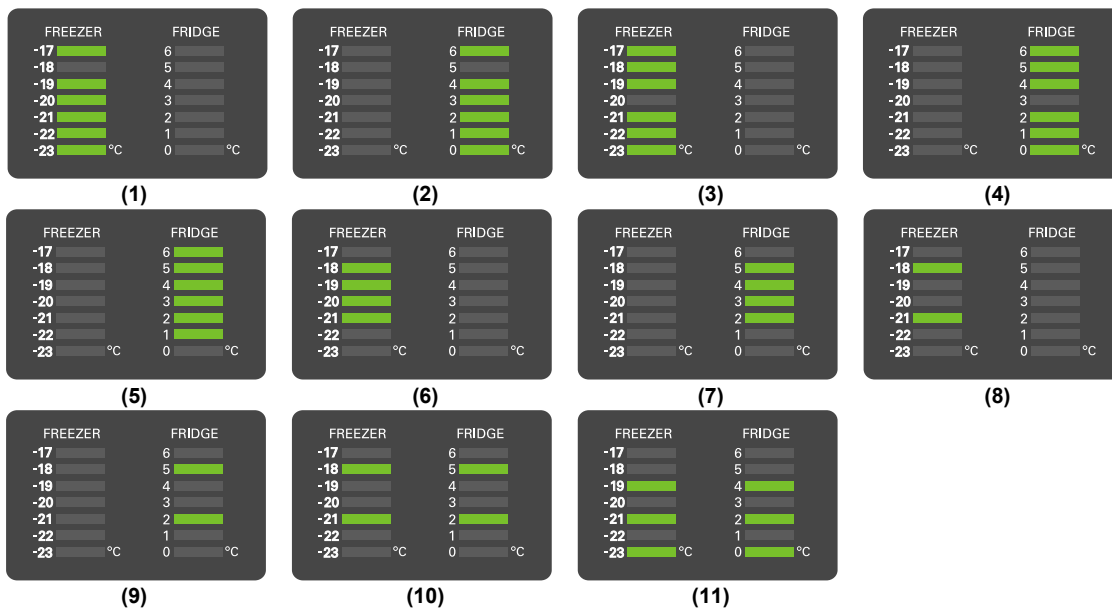
NO	Item	Error Code		Contents	Remarks
		Freezer	Refrigerator		
1	Normality	temperature.		-	Display Switch is normal
2	Failure of Freezer Sensor	FS	-	Cut or short circuit wire	Inspection connecting wires on each sensor.
3	Failure of Refrigerator Sensor	rS	-	Cut or short circuit wire	
4	Failure of Freezer Defrost Sensor	dS	F	Cut or short circuit wire	
5	Failure of Refrigerator Defrost Sensor	dS	r	Cut or short circuit wire	
6	Failure of Opti-Fresh Sensor	SS	-	Cut or short circuit wire	
7	Poor of Freezer Defrost	dH	F	80minute later After starting defrost. If sensor doesn't be over 5°C.	Snapping of defrost heater and Temperature fuse, Poor of Heater relay operation, Drain is blocked.
8	Poor of Refrigerator Defrost	dH	R	50minute later After starting defrost. If sensor doesn't be over 10°C.	
9	Failure of Fan Motor at Freezing Compartment.	FF	-	FF If there is no fan motor signal for more 65 sec in operation fan motor.	Poor motor, hooking to wire of fan and drive IC, TR
10	Failure of Fan Motor at Refrigerator Compartment.	rF	-		
11	Failure of Fan Motor at Mechanical Room	CF	-		
12	Failure of Communication	CO	-	If there is no signal for communication between main PCB and display PCB.	Short of lead wire connecting between main PCB and Display, transmission TR and receiving part.

► BETTER



NO	Item	Error Code		Contents	Remarks
		Freezer	Refrigerator		
1	Normality	temperature.		-	Display Switch is normal
2	Failure of Freezer Sensor	FS	-	Out or short circuit wire	Inspection connecting wires on each sensor.
3	Failure of Refrigerator Sensor	rS	-	Out or short circuit wire	
4	Failure of Freezer Defrost Sensor	dS	F	Out or short circuit wire	
5	Failure of Refrigerator Defrost Sensor	dS	r	Out or short circuit wire	
6	Poor of Freezer Defrost	dH	F	80minute later After starting defrost. If sensor doesn't be over 5°C.	Snapping of defrost heater and Temperature fuse, Poor of Heater relay operation, Drain is blocked.
7	Poor of Refrigerator Defrost	dH	R	50minute later After starting defrost. If sensor doesn't be over 10°C.	
8	Failure of Fan Motor at Freezing Compartment.	FF	-	FF If there is no fan motor signal for more 65 sec in operation fan motor.	Poor motor, hooking to wire of fan and drive IC, TR
9	Failure of Fan Motor at Refrigerator Compartment.	rF	-		
10	Failure of Fan Motor at Mechanical Room	CF	-		
11	Failure of Communication	OO	-	If there is no signal for communication between main PCB and display PCB.	Short of lead wire connecting between main PCB and Display, transmission TR and receiving part.

► BETTER



NO	Item	Error Code		Contents	Remarks
		Freezer	Refrigerator		
1	Normality	temperature.		-	Display Switch is normal
2	Failure of Freezer Sensor	(1)		Cut or short circuit wire	Inspection connecting wires on each sensor.
3	Failure of Refrigerator Sensor	(2)		Cut or short circuit wire	
4	Failure of Freezer Defrost Sensor	(3)		Cut or short circuit wire	
5	Failure of Refrigerator Defrost Sensor	(4)		Cut or short circuit wire	
6	Poor of Freezer Defrost	(5)		80minute later After starting defrost. If sensor doesn't be over 5°C.	Snapping of defrost heater and Temperature fuse, Poor of Heater relay operation, Drain is blocked.
7	Poor of Refrigerator Defrost	(6)		50minute later After starting defrost. If sensor doesn't be over 10°C.	
8	Failure of Fan Motor at Freezing Compartment.	(7)		FF If there is no fan motor signal for more 65 sec in operation fan motor.	Poor motor, hooking to wire of fan and drive IC, TR
9	Failure of Fan Motor at Refrigerator Compartment.	(8)			
10	Failure of Fan Motor at Mechanical Room	(9)			
11	Failure of Communication	(10)		If there is no signal for communication between main PCB and display PCB.	Short of lead wire connecting between main PCB and Display, transmission TR and receiving part.

MICOM Error Code

1. Error Code Summary



WARNING

When you check the Resistance values, be sure to turn off the power.
And wait for the voltage-discharge sufficiently.

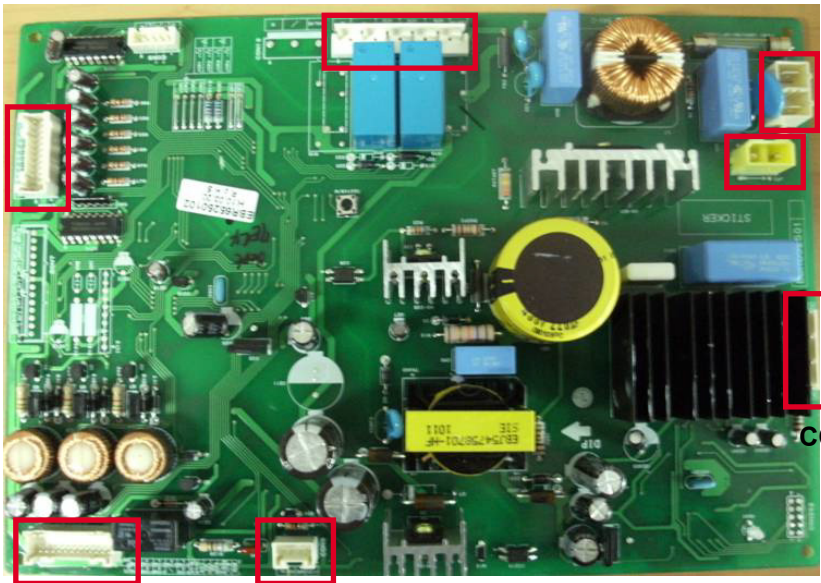
(1) FAILURE DIAGNOISS FUNCTION

○ : Normality

NO	Item	Load control						
		Comp	3-Way Valve	F-FAN	R-FAN	C-FAN	F-Defrost Heater	R-Defrost Heater
1	Normal	○	○	○	○	○	○	○
2	Failure of Freezer Sensor	30min ON / 10min OFF	F 20min R 10min	○	○	○	○	○
3	Failure of Refrigerator Sensor	30min ON / 10min OFF	F 20min R 10min	○	○	○	○	○
4	Failure of Freezer Defrost Sensor	○	○	○	○	○	No Defrosting	○
5	Failure of Refrigerator Defrost Sensor	○	○	○	○	○	○	No Defrosting
6	Poor of Freezer Defrost	○	○	○	○	○	○	○
7	Poor of Refrigerator Defrost	○	○	○	○	○	○	○
8	Failure of Fan Motor at Freezing Compartment.	○	○	Every 30min On/Off	○	○	○	○
9	Failure of Fan Motor at Refrigerator Compartment.	○	○	○	Every 30min On/Off	○	○	○
10	Failure of Fan Motor at Mechanical Room	○	○	○	○	Every 30min On/Off	○	○
11	Failure of Communication	○	○	○	○	○	○	○

PCB Picture

1. Main PCB

P/No & MFG	Picture
EBR652501	 <p>The image shows a green printed circuit board (PCB) populated with various electronic components. Several connectors are highlighted with red rectangular boxes and labeled as follows:</p> <ul style="list-style-type: none">CON3: A multi-pin connector located at the top center of the board.CON1: A small connector located on the right edge, near the top.CON2: A small connector located on the right edge, below CON1.CON5: A multi-pin connector located on the left edge, near the top.CON6: A multi-pin connector located on the bottom left edge.CON8: A small connector located on the bottom center edge.CON201: A multi-pin connector located on the right edge, near the bottom. <p>The board also features a large yellow electrolytic capacitor, a toroidal inductor, several blue electrolytic capacitors, and various integrated circuits and resistors.</p>

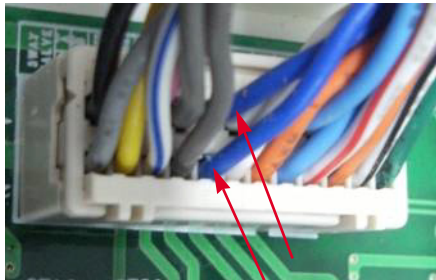
2. Display PCB

P/No	Picture
EBR64736301	
EBR65008001	
EBR65256001	
EBR65255701	

Troubleshooting With Error Display


1. Freezer Sensor Error (FS)



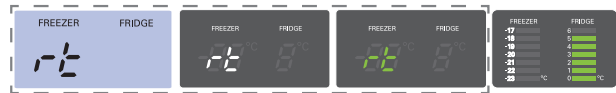
No	Checking flow	Result & SVC Action																												
1	Check for a loose connection.																													
2	<div>Check the <u>Blue to Blue</u>.</div> <div></div> <div><CON5></div>	<table><tr><th colspan="2">Result</th><th>SVC Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-1)</td></tr></table> <div><Temperature table-1></div> <table><tr><th>(1) To (2)</th><th>Result</th></tr><tr><td>-22°F / -30°C</td><td>40 kΩ</td></tr><tr><td>-13°F / -25°C</td><td>30 kΩ</td></tr><tr><td>-4°F / -20°C</td><td>23 kΩ</td></tr><tr><td>5°F / -15°C</td><td>17 kΩ</td></tr><tr><td>14°F / -10°C</td><td>13 kΩ</td></tr><tr><td>23°F / -5°C</td><td>10 kΩ</td></tr><tr><td>32°F / 0°C</td><td>8 kΩ</td></tr></table> <div>※ The sensor is determined by the temperature. For example, 23kΩ indicates -20°C.</div>	Result		SVC Action	0 Ω	Short	Change the sensor	OFF	Open	Replace the refrigerator	Other	Normal	Check the Temp and resistance (Table-1)	(1) To (2)	Result	-22°F / -30°C	40 kΩ	-13°F / -25°C	30 kΩ	-4°F / -20°C	23 kΩ	5°F / -15°C	17 kΩ	14°F / -10°C	13 kΩ	23°F / -5°C	10 kΩ	32°F / 0°C	8 kΩ
Result		SVC Action																												
0 Ω	Short	Change the sensor																												
OFF	Open	Replace the refrigerator																												
Other	Normal	Check the Temp and resistance (Table-1)																												
(1) To (2)	Result																													
-22°F / -30°C	40 kΩ																													
-13°F / -25°C	30 kΩ																													
-4°F / -20°C	23 kΩ																													
5°F / -15°C	17 kΩ																													
14°F / -10°C	13 kΩ																													
23°F / -5°C	10 kΩ																													
32°F / 0°C	8 kΩ																													


2. Fridge Sensor Error (rS)



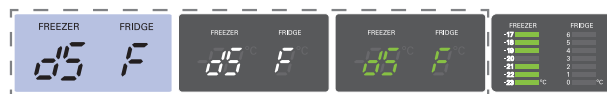
No	Checking flow	Result & SVC Action																								
1	Check for a loose connection.																									
2	<div>Check the <u>White to White</u>.</div> <div></div> <div><CON5></div>	<table><tr><th colspan="2">Result</th><th>SVC Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-2)</td></tr></table> <div><Temperature table-2></div> <table><tr><th>Temperature</th><th>Result</th></tr><tr><td>23°F / -5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table> <div>※ The sensor is determined by the temperature. For example, 30kΩ indicates 0°C.</div>	Result		SVC Action	0 Ω	Short	Change the sensor	OFF	Open	Replace the refrigerator	Other	Normal	Check the Temp and resistance (Table-2)	Temperature	Result	23°F / -5°C	38 kΩ	32°F / 0°C	30 kΩ	41°F / 5°C	24kΩ	50°F / 10°C	19.5 kΩ	59°F / 15°C	16 kΩ
Result		SVC Action																								
0 Ω	Short	Change the sensor																								
OFF	Open	Replace the refrigerator																								
Other	Normal	Check the Temp and resistance (Table-2)																								
Temperature	Result																									
23°F / -5°C	38 kΩ																									
32°F / 0°C	30 kΩ																									
41°F / 5°C	24kΩ																									
50°F / 10°C	19.5 kΩ																									
59°F / 15°C	16 kΩ																									


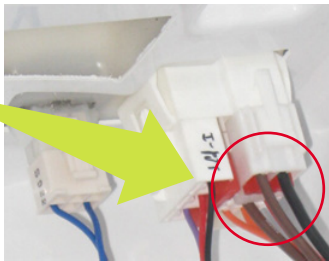


3. RT Sensor Error (rt)



No	Checking flow	Result & SVC Action																								
1	Check for a loose connection.																									
2	<div>Check the <u>Brown to Brown</u>.</div> <div></div> <div><CON5></div>	<table><tr><th colspan="2">Result</th><th>SVC Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-2)</td></tr></table> <div><Temperature table-2></div> <table><tr><th>Temperature</th><th>Result</th></tr><tr><td>23°F / -5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24 kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table> <div>※ The sensor is determined by the temperature. For example, 30kΩ indicates 0°C.</div>	Result		SVC Action	0 Ω	Short	Change the sensor	OFF	Open	Replace the refrigerator	Other	Normal	Check the Temp and resistance (Table-2)	Temperature	Result	23°F / -5°C	38 kΩ	32°F / 0°C	30 kΩ	41°F / 5°C	24 kΩ	50°F / 10°C	19.5 kΩ	59°F / 15°C	16 kΩ
Result		SVC Action																								
0 Ω	Short	Change the sensor																								
OFF	Open	Replace the refrigerator																								
Other	Normal	Check the Temp and resistance (Table-2)																								
Temperature	Result																									
23°F / -5°C	38 kΩ																									
32°F / 0°C	30 kΩ																									
41°F / 5°C	24 kΩ																									
50°F / 10°C	19.5 kΩ																									
59°F / 15°C	16 kΩ																									

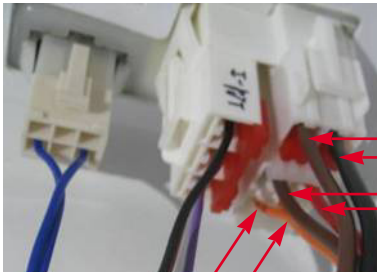

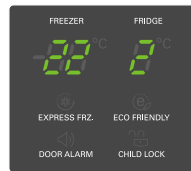

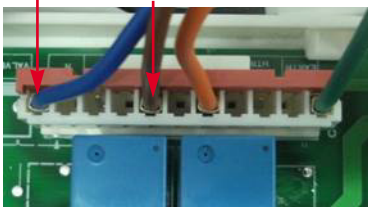



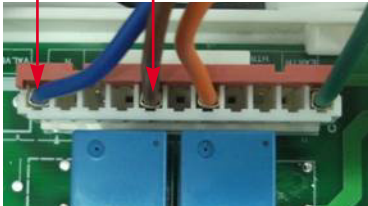
4. Defrost Sensor Error (dS F)



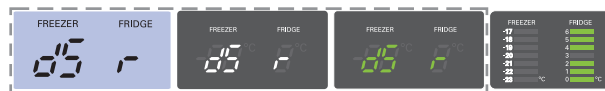
No	Checking flow	Result & SVC Action																												
1	<p>Check for a loose connection.</p> <div><p><CON5></p><div></div></div>																													
2	<p>Check the <u>Violet to Violet</u>.</p> <div><p><CON5></p></div>	<table><tr><th colspan="2">Result</th><th>SVC Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-3)</td></tr></table> <p><Temperature table-3></p> <table><tr><th>(1) To (2)</th><th>Result</th></tr><tr><td>-22°F / -30°C</td><td>40 kΩ</td></tr><tr><td>-13°F / -25°C</td><td>30 kΩ</td></tr><tr><td>-4°F / -20°C</td><td>23 kΩ</td></tr><tr><td>5°F / -15°C</td><td>17 kΩ</td></tr><tr><td>14°F / -10°C</td><td>13 kΩ</td></tr><tr><td>23°F / -5°C</td><td>10 kΩ</td></tr><tr><td>32°F / 0°C</td><td>8 kΩ</td></tr></table> <p>※ The sensor is determined by the temperature. For example, 23kΩ indicates -20°C.</p>	Result		SVC Action	0 Ω	Short	Change the sensor	OFF	Open	Replace the refrigerator	Other	Normal	Check the Temp and resistance (Table-3)	(1) To (2)	Result	-22°F / -30°C	40 kΩ	-13°F / -25°C	30 kΩ	-4°F / -20°C	23 kΩ	5°F / -15°C	17 kΩ	14°F / -10°C	13 kΩ	23°F / -5°C	10 kΩ	32°F / 0°C	8 kΩ
Result		SVC Action																												
0 Ω	Short	Change the sensor																												
OFF	Open	Replace the refrigerator																												
Other	Normal	Check the Temp and resistance (Table-3)																												
(1) To (2)	Result																													
-22°F / -30°C	40 kΩ																													
-13°F / -25°C	30 kΩ																													
-4°F / -20°C	23 kΩ																													
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14°F / -10°C	13 kΩ																													
23°F / -5°C	10 kΩ																													
32°F / 0°C	8 kΩ																													


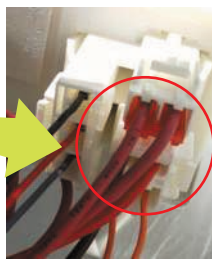

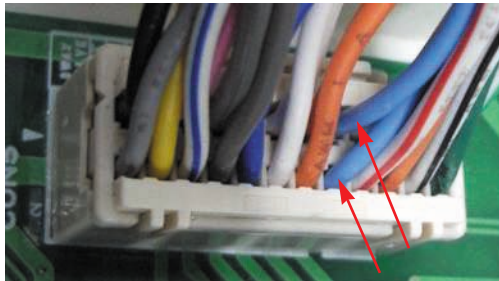
5. Defrost Heater Error (dH F)



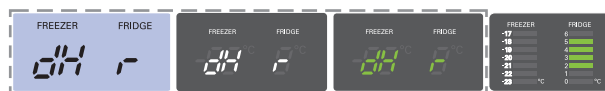
No	Checking flow	Result & SVC Action																		
1	Check the <u>Door gasket.</u>	<table><tr><th>Part</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">Fuse-M</td><td>0 Ω</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Change Fuse-M</td></tr><tr><td rowspan="2">Def' Heater</td><td>34~42 Ω</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Change Fuse-M</td></tr><tr><td rowspan="2">Def' Sensor</td><td>0 Ω</td><td>Go to the 3</td></tr><tr><td>OFF</td><td>Replace product</td></tr></table>	Part	Result	SVC Action	Fuse-M	0 Ω	Go to the 3	Other	Change Fuse-M	Def' Heater	34~42 Ω	Go to the 3	Other	Change Fuse-M	Def' Sensor	0 Ω	Go to the 3	OFF	Replace product
Part	Result		SVC Action																	
Fuse-M	0 Ω		Go to the 3																	
	Other		Change Fuse-M																	
Def' Heater	34~42 Ω		Go to the 3																	
	Other	Change Fuse-M																		
Def' Sensor	0 Ω	Go to the 3																		
	OFF	Replace product																		
2	Check the <u>Defrost control part.</u>  <p>Def' Heater Fuse M Def' Sensor</p>																			
3	Input Test 2 Mode. (Push the button 2 times)	  																		
4	Check the <u>Brown to Blue.</u>  <p><CON3></p>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>220 ~ 240 V</td><td>Go to the 5</td></tr><tr><td>0 V</td><td>Replace Main PCB</td></tr></table>	Result	SVC Action	220 ~ 240 V	Go to the 5	0 V	Replace Main PCB												
Result	SVC Action																			
220 ~ 240 V	Go to the 5																			
0 V	Replace Main PCB																			
5	Release the test mode. Push the button 1 times. (Normal)	  																		
6	Check the <u>Brown to Blue.</u>  <p><CON3></p>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 V</td><td>Explain to customer</td></tr><tr><td>220 ~ 240 V</td><td>Replace Main PCB</td></tr></table>	Result	SVC Action	0 V	Explain to customer	220 ~ 240 V	Replace Main PCB												
Result	SVC Action																			
0 V	Explain to customer																			
220 ~ 240 V	Replace Main PCB																			

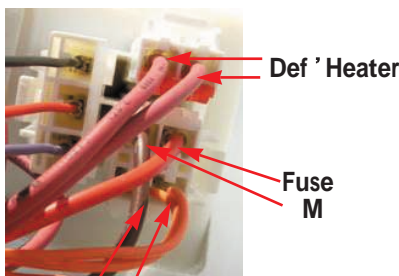

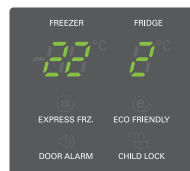
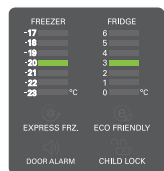
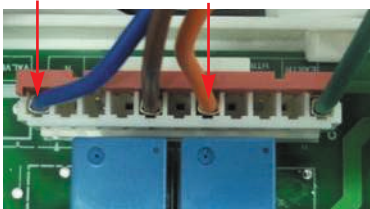



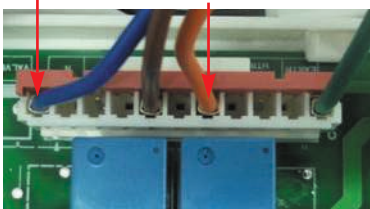
6. Defrost Sensor Error (dS r)



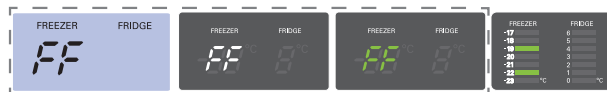
No	Checking ow	Result & SVC Action																												
1	<p>Check for a loose connection.</p> <div><p><CON5></p><div></div></div>																													
2	<p>Check the <u>Violet to Violet</u>.</p> <div><p><CON5></p></div>	<table><tr><th colspan="2">Result</th><th>SVC Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-3)</td></tr></table> <p><Temperature table-3></p> <table><tr><th>(1) To (2)</th><th>Result</th></tr><tr><td>-22°F / -30°C</td><td>40 kΩ</td></tr><tr><td>-13°F / -25°C</td><td>30 kΩ</td></tr><tr><td>-4°F / -20°C</td><td>23 kΩ</td></tr><tr><td>5°F / -15°C</td><td>17 kΩ</td></tr><tr><td>14°F / -10°C</td><td>13 kΩ</td></tr><tr><td>23°F / -5°C</td><td>10 kΩ</td></tr><tr><td>32°F / 0°C</td><td>8 kΩ</td></tr></table> <p>※ The sensor is determined by the temperature. For example, 23 kΩ indicates -20°C.</p>	Result		SVC Action	0 Ω	Short	Change the sensor	OFF	Open	Replace the refrigerator	Other	Normal	Check the Temp and resistance (Table-3)	(1) To (2)	Result	-22°F / -30°C	40 kΩ	-13°F / -25°C	30 kΩ	-4°F / -20°C	23 kΩ	5°F / -15°C	17 kΩ	14°F / -10°C	13 kΩ	23°F / -5°C	10 kΩ	32°F / 0°C	8 kΩ
Result		SVC Action																												
0 Ω	Short	Change the sensor																												
OFF	Open	Replace the refrigerator																												
Other	Normal	Check the Temp and resistance (Table-3)																												
(1) To (2)	Result																													
-22°F / -30°C	40 kΩ																													
-13°F / -25°C	30 kΩ																													
-4°F / -20°C	23 kΩ																													
5°F / -15°C	17 kΩ																													
14°F / -10°C	13 kΩ																													
23°F / -5°C	10 kΩ																													
32°F / 0°C	8 kΩ																													








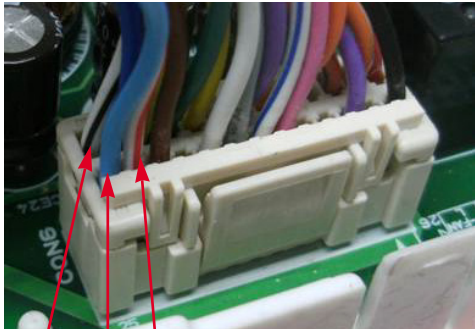
7. Defrost Heater Error (dH r)

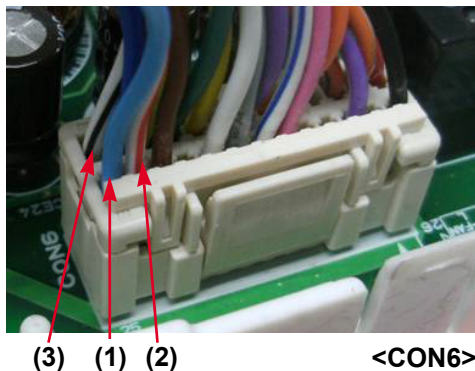


No	Checking ow	Result & SVC Action																		
1	Check the <u>Door gasket.</u>	<table><tr><th>Part</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">Fuse-M</td><td>0 Ω</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Change Fuse-M</td></tr><tr><td rowspan="2">Def ' Heater</td><td>34~42 Ω</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Change Fuse-M</td></tr><tr><td rowspan="2">Def ' Sensor</td><td>0 Ω</td><td>Go to the 3</td></tr><tr><td>OFF</td><td>Replace product</td></tr></table>	Part	Result	SVC Action	Fuse-M	0 Ω	Go to the 3	Other	Change Fuse-M	Def ' Heater	34~42 Ω	Go to the 3	Other	Change Fuse-M	Def ' Sensor	0 Ω	Go to the 3	OFF	Replace product
Part	Result		SVC Action																	
Fuse-M	0 Ω		Go to the 3																	
	Other		Change Fuse-M																	
Def ' Heater	34~42 Ω		Go to the 3																	
	Other	Change Fuse-M																		
Def ' Sensor	0 Ω	Go to the 3																		
	OFF	Replace product																		
2	Check the <u>Defrost control part.</u>  Def ' Heater Fuse M Def ' Sensor																			
3	Input Test 2 Mode. (Push the button 2 times)	  																		
4	Check the <u>Orange to Blue.</u>  <CON3>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>220 ~ 240 V</td><td>Go to the 5</td></tr><tr><td>0 V</td><td>Replace Main PCB</td></tr></table>	Result	SVC Action	220 ~ 240 V	Go to the 5	0 V	Replace Main PCB												
Result	SVC Action																			
220 ~ 240 V	Go to the 5																			
0 V	Replace Main PCB																			
5	R lease the test mode. Push the button 1 times. (Normal)	  																		
6	Check the <u>Orange to Blue.</u>  <CON3>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 V</td><td>Explain to customer</td></tr><tr><td>220 ~ 240 V</td><td>Replace Main PCB</td></tr></table>	Result	SVC Action	0 V	Explain to customer	220 ~ 240 V	Replace Main PCB												
Result	SVC Action																			
0 V	Explain to customer																			
220 ~ 240 V	Replace Main PCB																			

8. Freezer Fan Error (FF)

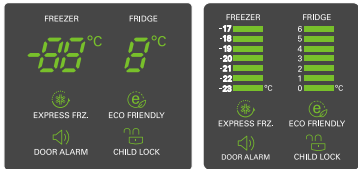



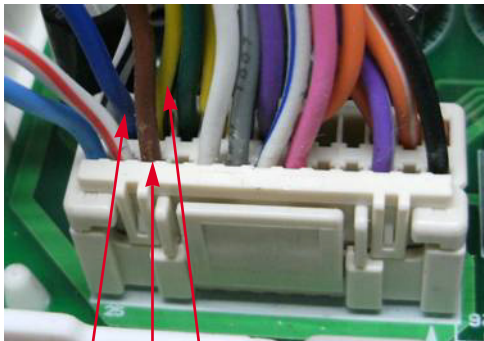


No	Checking flow	Result & SVC Action									
1	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>	<div></div>									
2	<p>Open the freezer door and Check the air flow.</p> <p>※ While an error code is displayed, the fan is not working.</p>	<div><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>No windy</td><td>Go to 3</td></tr><tr><td>Windy</td><td>Go to 4</td></tr></table></div>	Status	SVC Action	No windy	Go to 3	Windy	Go to 4			
Status	SVC Action										
No windy	Go to 3										
Windy	Go to 4										
3	<p>Check the <u>Fan motor</u>.</p> <div></div>	<p>Rotate fan using your hand. It feel sticky, change the motor. (Cause of ice or rust inside of motor)</p>									
4	<p>Check the <u>Fan motor voltage</u>.</p> <div><p>(3) (1) (2)</p><p><CON6></p></div>	<table><tr><th>Point</th><th>Result</th><th>SVC Action</th></tr><tr><td>(1) ~ (2)</td><td>Below 12 V</td><td>Change the PCB</td></tr><tr><td>(2) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr></table>	Point	Result	SVC Action	(1) ~ (2)	Below 12 V	Change the PCB	(2) ~ (3)	0 or 5 V	Change the motor
Point	Result	SVC Action									
(1) ~ (2)	Below 12 V	Change the PCB									
(2) ~ (3)	0 or 5 V	Change the motor									

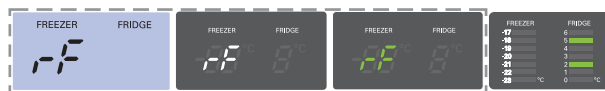


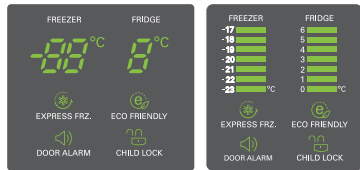



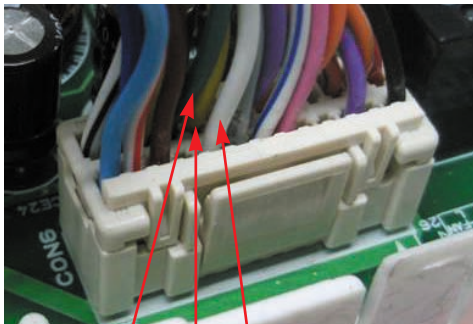
9. Condenser Fan Error (CF)



No	Checking flow	Result & SVC Action									
1	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>	<div></div>									
2	<p>Check the fan rotating.</p> <p>※ While an error code is displayed, the fan is not working.</p>	<div><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>No windy</td><td>Check motor</td></tr><tr><td>Windy</td><td>Go to the 5</td></tr></table></div>	Status	SVC Action	No windy	Check motor	Windy	Go to the 5			
Status	SVC Action										
No windy	Check motor										
Windy	Go to the 5										
3	<p>Check the <u>Fan motor</u> and <u>surrounding</u>.</p> 	<p>Rotate fan using your hand. It feel sticky, change the motor.</p>									
4	<p>Check the <u>Fan motor voltage</u>.</p>  <p>(1) (2) (3) <CON6></p>	<table><tr><th></th><th>Result</th><th>SVC Action</th></tr><tr><td>(1) ~ (2)</td><td>Below 12 V</td><td>Change the PCB</td></tr><tr><td>(2) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr></table>		Result	SVC Action	(1) ~ (2)	Below 12 V	Change the PCB	(2) ~ (3)	0 or 5 V	Change the motor
	Result	SVC Action									
(1) ~ (2)	Below 12 V	Change the PCB									
(2) ~ (3)	0 or 5 V	Change the motor									









10. Refrigerator Fan Error (rF)



No	Checking ow	Result & SVC Action									
1	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>	<div></div>									
2	<p>Open the Refrigerator door and Check the air ow.</p> <p>※ While an error code is displayed, the fan is not working.</p>	<div><table><thead><tr><th>Status</th><th>SVC Action</th></tr></thead><tbody><tr><td>No windy</td><td>Go to 3</td></tr><tr><td>Windy</td><td>Go to 4</td></tr></tbody></table></div>	Status	SVC Action	No windy	Go to 3	Windy	Go to 4			
Status	SVC Action										
No windy	Go to 3										
Windy	Go to 4										
3	<p>Check the Fan motor.</p> <div></div>	<p>Rotate fan using your hand. It feel sticky, change the motor. (Cause of ice or rust inside of motor)</p>									
4	<p>Check the Fan motor voltage.</p> <div><div>(1) (3) (2) <CON6></div></div>	<table><thead><tr><th>Point</th><th>Result</th><th>SVC Action</th></tr></thead><tbody><tr><td>(1) ~ (2)</td><td>Below 12 V</td><td>Change the PCB</td></tr><tr><td>(1) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr></tbody></table>	Point	Result	SVC Action	(1) ~ (2)	Below 12 V	Change the PCB	(1) ~ (3)	0 or 5 V	Change the motor
Point	Result	SVC Action									
(1) ~ (2)	Below 12 V	Change the PCB									
(1) ~ (3)	0 or 5 V	Change the motor									


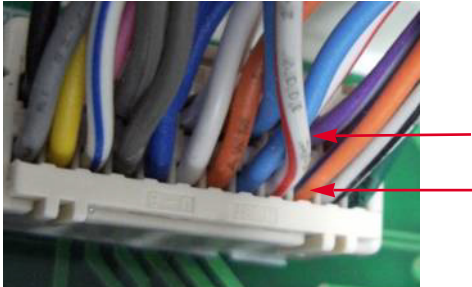
11. Communication Error (Er CO)



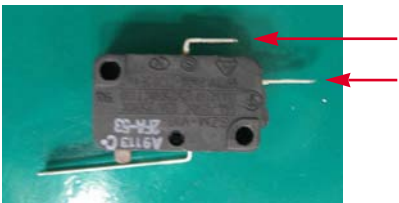


No	Checking flow	Result & SVC Action						
1	Check the loose connection.							
2	Check the <u>Blue to Brown</u> .   <CON101_display>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>12 V</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Check the Hinge (Loose connection) Change the Main PCB</td></tr></table>	Result	SVC Action	12 V	Go to the 3	Other	Check the Hinge (Loose connection) Change the Main PCB
Result	SVC Action							
12 V	Go to the 3							
Other	Check the Hinge (Loose connection) Change the Main PCB							
3	Check the <u>White to Brown</u> .   <CON101_display>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 V or 5 V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 4</td></tr></table>	Result	SVC Action	0 V or 5 V	Change the Display PCB	Other	Go to the 4
Result	SVC Action							
0 V or 5 V	Change the Display PCB							
Other	Go to the 4							
4	Check the <u>Sky Blue to Brown</u> .   <CON101_display>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 V or 5 V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Go to the 5</td></tr></table>	Result	SVC Action	0 V or 5 V	Change the Main PCB	Other	Go to the 5
Result	SVC Action							
0 V or 5 V	Change the Main PCB							
Other	Go to the 5							
5	Check the <u>White to Brown</u> .  <CON8_Main>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 V or 5 V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 6</td></tr></table>	Result	SVC Action	0 V or 5 V	Change the Display PCB	Other	Go to the 6
Result	SVC Action							
0 V or 5 V	Change the Display PCB							
Other	Go to the 6							
6	Check the <u>Sky Blue to Brown</u> .  <CON8_Main>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 V or 5 V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Explain to customer</td></tr></table>	Result	SVC Action	0 V or 5 V	Change the Main PCB	Other	Explain to customer
Result	SVC Action							
0 V or 5 V	Change the Main PCB							
Other	Explain to customer							

Troubleshooting Without Error Display

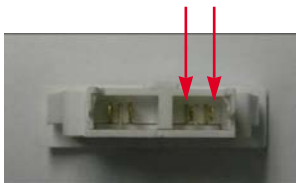
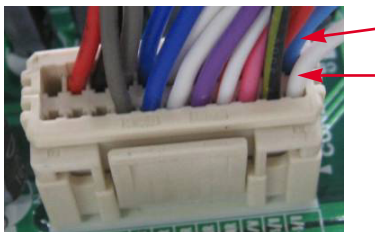
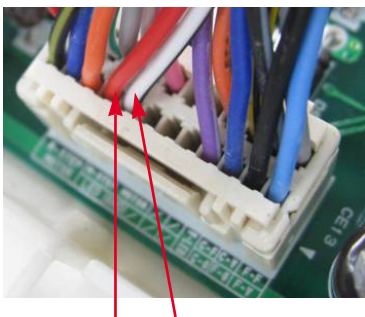
1. Vegetable LED doesn't work

No	Checking flow	Result & SVC Action						
1	<p>Check the loose connection.</p> <div></div>							
2	<p>Check the <u>Purple to Orange/Blue</u></p> <div></div> <p><CON5></p>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 or 12 V</td><td>Explain to customer</td></tr><tr><td>Other</td><td>Change the PCB</td></tr></table>	Result	SVC Action	0 or 12 V	Explain to customer	Other	Change the PCB
Result	SVC Action							
0 or 12 V	Explain to customer							
Other	Change the PCB							






2. Water pump motor doesn't work



No	Checking flow	Result & SVC Action													
1	Check the loose connection.														
2	Check the <u>Dispenser S/W resistance</u> . 	<table> <tr> <th>Status</th><th>Result</th><th>SVC Action</th></tr> <tr> <td rowspan="2">Normal</td><td>0 Ω</td><td>Go to the 3</td></tr> <tr> <td>not</td><td>Change door S/W</td></tr> <tr> <td rowspan="2">Push S/W</td><td>Infinity</td><td>Go to the 3</td></tr> <tr> <td></td><td>Change door S/W</td></tr> </table>	Status	Result	SVC Action	Normal	0 Ω	Go to the 3	not	Change door S/W	Push S/W	Infinity	Go to the 3		Change door S/W
Status	Result	SVC Action													
Normal	0 Ω	Go to the 3													
	not	Change door S/W													
Push S/W	Infinity	Go to the 3													
		Change door S/W													
3	Check the <u>White to Sky Blue</u> . 	<table> <tr> <th>Status</th><th>Result</th><th>SVC Action</th></tr> <tr> <td rowspan="2">Normal</td><td>5 V</td><td>Go to the 4</td></tr> <tr> <td>Other</td><td>Change the PCB</td></tr> <tr> <td rowspan="2">Push S/W</td><td>0 V</td><td>Go to the 4</td></tr> <tr> <td>Other</td><td>Change the PCB</td></tr> </table>	Status	Result	SVC Action	Normal	5 V	Go to the 4	Other	Change the PCB	Push S/W	0 V	Go to the 4	Other	Change the PCB
Status	Result	SVC Action													
Normal	5 V	Go to the 4													
	Other	Change the PCB													
Push S/W	0 V	Go to the 4													
	Other	Change the PCB													
4	Check the <u>Red to white/Black</u> . 	<table> <tr> <th>Status</th><th>Result</th><th>SVC Action</th></tr> <tr> <td rowspan="2">Normal</td><td>0 ~ 2 V</td><td>Explain to customer</td></tr> <tr> <td>Other</td><td>Change the PCB</td></tr> <tr> <td rowspan="2">Push S/W</td><td>10 ~ 12 V</td><td>Explain to customer</td></tr> <tr> <td>Other</td><td>Change the PCB</td></tr> </table>	Status	Result	SVC Action	Normal	0 ~ 2 V	Explain to customer	Other	Change the PCB	Push S/W	10 ~ 12 V	Explain to customer	Other	Change the PCB
Status	Result	SVC Action													
Normal	0 ~ 2 V	Explain to customer													
	Other	Change the PCB													
Push S/W	10 ~ 12 V	Explain to customer													
	Other	Change the PCB													

3. Refrigerator room lamp doesn't work

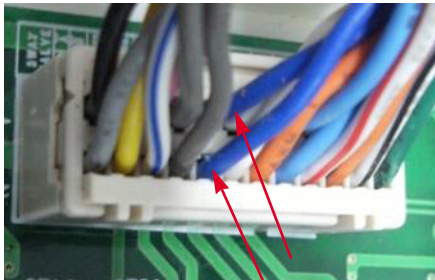
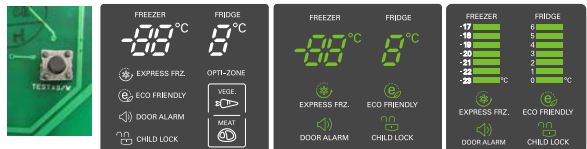

No	Checking flow	Result & SVC Action													
1	Check the loose connection.														
2	Check the Refrigerator door switch.	If feel sticky, Change the door s/w.													
3	Check the <u>door S/W resistance</u> . 	<table><tr><th>Status</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">Normal</td><td>0 Ω</td><td>Go to the 3</td></tr><tr><td>not</td><td>Change door S/W</td></tr><tr><td rowspan="2">Push S/W</td><td>Infinity</td><td>Go to the 3</td></tr><tr><td></td><td>Change door S/W</td></tr></table>	Status	Result	SVC Action	Normal	0 Ω	Go to the 3	not	Change door S/W	Push S/W	Infinity	Go to the 3		Change door S/W
Status	Result	SVC Action													
Normal	0 Ω	Go to the 3													
	not	Change door S/W													
Push S/W	Infinity	Go to the 3													
		Change door S/W													
4	Check the <u>White to Sky Blue</u> .  <CON4>	<table><tr><th>Status</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">Closed</td><td>5 V</td><td>Go to the 4</td></tr><tr><td>Other</td><td>Change the PCB</td></tr><tr><td rowspan="2">Open</td><td>0 V</td><td>Go to the 4</td></tr><tr><td>Other</td><td>Change the PCB</td></tr></table>	Status	Result	SVC Action	Closed	5 V	Go to the 4	Other	Change the PCB	Open	0 V	Go to the 4	Other	Change the PCB
Status	Result	SVC Action													
Closed	5 V	Go to the 4													
	Other	Change the PCB													
Open	0 V	Go to the 4													
	Other	Change the PCB													
5	Check the <u>Red to White/Black</u> .  <CON6>	<table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>12 V</td><td>Explain to customer</td></tr><tr><td>Other</td><td>Change the PCB</td></tr></table>	Result	SVC Action	12 V	Explain to customer	Other	Change the PCB							
Result	SVC Action														
12 V	Explain to customer														
Other	Change the PCB														


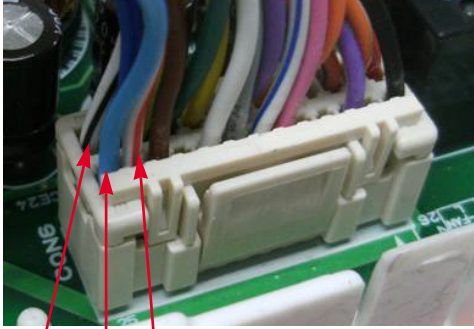
4. Poor cooling in Refrigerator compartment

No	Checking flow	Result & SVC Action												
1	<p>Check the sensor resistance.</p>  <p><CON5></p> <p>※ The sensor is determined by the temperature. For example, 30kΩ indicates 0°C.</p>	<table><tr><th>Temperature</th><th>Result</th></tr><tr><td>23°F / -5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24 kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table>	Temperature	Result	23°F / -5°C	38 kΩ	32°F / 0°C	30 kΩ	41°F / 5°C	24 kΩ	50°F / 10°C	19.5 kΩ	59°F / 15°C	16 kΩ
Temperature	Result													
23°F / -5°C	38 kΩ													
32°F / 0°C	30 kΩ													
41°F / 5°C	24 kΩ													
50°F / 10°C	19.5 kΩ													
59°F / 15°C	16 kΩ													
2	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>	 												
3	<p>Open the fresh food door and Check the air flow.</p> 	<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 4</td></tr><tr><td>No windy</td><td>Check the Fan motor (Next page)</td></tr></table>	Status	SVC Action	Windy	Go to the 4	No windy	Check the Fan motor (Next page)						
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4	<p>Open the fresh food door and Check the air flow.</p> 	<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 5</td></tr><tr><td>No windy</td><td>Check the damper (Go to the 6)</td></tr></table>	Status	SVC Action	Windy	Go to the 5	No windy	Check the damper (Go to the 6)						
Status	SVC Action													
Windy	Go to the 5													
No windy	Check the damper (Go to the 6)													
5	<p>Check the air temperature. Cold or not?</p>	<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Cold</td><td>Explain to customer</td></tr><tr><td>Not cold</td><td>Check the Compressor And sealed system</td></tr></table>	Status	SVC Action	Cold	Explain to customer	Not cold	Check the Compressor And sealed system						
Status	SVC Action													
Cold	Explain to customer													
Not cold	Check the Compressor And sealed system													

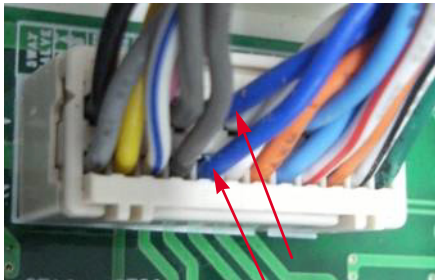





No	Checking flow	Result & SVC Action									
6	<p>Check the <u>Fan motor</u>. Rotate fan using your hand. It feel sticky, change the motor. (Cause of ice or rust inside of motor)</p> 	<table> <tr> <th>Point</th><th>Result</th><th>SVC Action</th></tr> <tr> <td>Motor</td><td>Sticky</td><td>Change the motor</td></tr> </table>	Point	Result	SVC Action	Motor	Sticky	Change the motor			
Point	Result	SVC Action									
Motor	Sticky	Change the motor									
7	<p>Check the <u>Fan motor voltage</u>.</p>  <p>(1) (3) (2) <CON6></p>	<table> <tr> <th>Point</th><th>Result</th><th>SVC Action</th></tr> <tr> <td>(1) ~ (2)</td><td>Below 12 V</td><td>Change the PCB</td></tr> <tr> <td>(2) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr> </table>	Point	Result	SVC Action	(1) ~ (2)	Below 12 V	Change the PCB	(2) ~ (3)	0 or 5 V	Change the motor
Point	Result	SVC Action									
(1) ~ (2)	Below 12 V	Change the PCB									
(2) ~ (3)	0 or 5 V	Change the motor									

5. Poor cooling in Freezer compartment

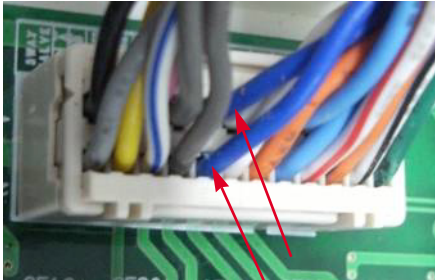
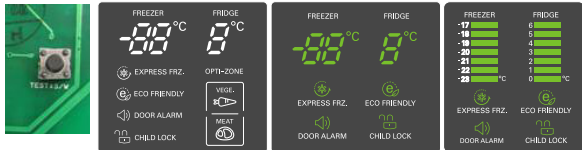
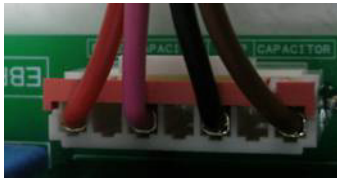
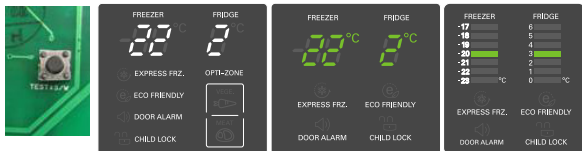
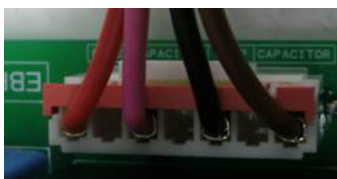
No	Checking flow	Result & SVC Action																
1	<p>Check the sensor resistance.</p>  <p><CON5></p> <p>※ The sensor is determined by the temperature. For example, 23kΩ indicates -20°C.</p>	<table><tr><th>(1) To (2)</th><th>Result</th></tr><tr><td>-22°F / -30°C</td><td>40 kΩ</td></tr><tr><td>-13°F / -25°C</td><td>30 kΩ</td></tr><tr><td>-4°F / -20°C</td><td>23 kΩ</td></tr><tr><td>5°F / -15°C</td><td>17. kΩ</td></tr><tr><td>14°F / -10°C</td><td>13 kΩ</td></tr><tr><td>23°F / -5°C</td><td>10 kΩ</td></tr><tr><td>32°F / 0°C</td><td>8 kΩ</td></tr></table>	(1) To (2)	Result	-22°F / -30°C	40 kΩ	-13°F / -25°C	30 kΩ	-4°F / -20°C	23 kΩ	5°F / -15°C	17. kΩ	14°F / -10°C	13 kΩ	23°F / -5°C	10 kΩ	32°F / 0°C	8 kΩ
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32°F / 0°C	8 kΩ																	
2	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>																	
3	<p>Open the freezer door and check the air flow.</p> 	<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 4</td></tr><tr><td>No windy</td><td>Check the Fan motor (Next page)</td></tr></table>	Status	SVC Action	Windy	Go to the 4	No windy	Check the Fan motor (Next page)										
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Point	Result	SVC Action									
Motor	Sticky	Change the motor									
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Point	Result	SVC Action									
(1) ~ (2)	Below 12 V	Change the PCB									
(2) ~ (3)	0 or 5 V	Change the motor									

6. Over cooling in Refrigerator compartment

No	Checking flow	Result & SVC Action												
1	<p>Check the sensor resistance.</p> <div></div> <p><CON5></p> <p>※ The sensor is determined by the temperature. For example, 30kΩ indicates 32°F.</p>	<table><tr><th>Temperature</th><th>Result</th></tr><tr><td>23°F / -5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table>	Temperature	Result	23°F / -5°C	38 kΩ	32°F / 0°C	30 kΩ	41°F / 5°C	24kΩ	50°F / 10°C	19.5 kΩ	59°F / 15°C	16 kΩ
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59°F / 15°C	16 kΩ													
2	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>	<div></div>												
3	<p>Open the refrigerator door and Check the air flow.</p> <div></div>	<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 4</td></tr><tr><td>No windy</td><td>Check the damper (Go to the 5)</td></tr></table>	Status	SVC Action	Windy	Go to the 4	No windy	Check the damper (Go to the 5)						
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Windy	Go to the 4													
No windy	Check the damper (Go to the 5)													
4	<p>Input Test 2 Mode and Check the air flow. (Push the button 1 time)</p> <div></div>	<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 5</td></tr><tr><td>No windy</td><td>It's normal</td></tr></table>	Status	SVC Action	Windy	Go to the 5	No windy	It's normal						
Status	SVC Action													
Windy	Go to the 5													
No windy	It's normal													

7. Over cooling in Freezer compartment

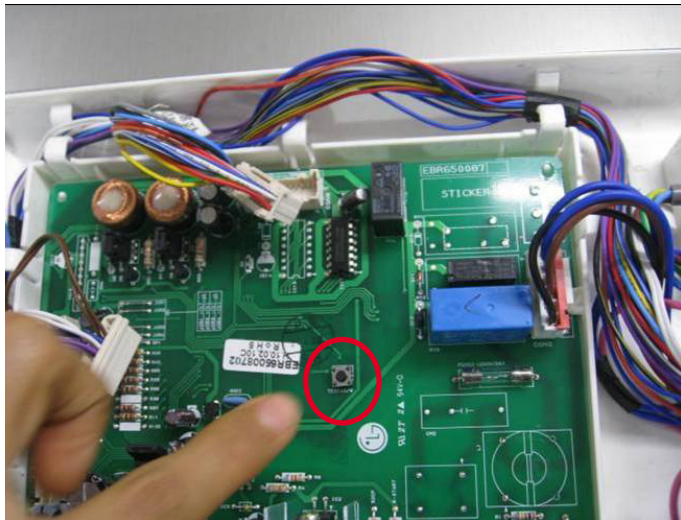
No	Checking flow	Result & SVC Action																
1	<p>Check the sensor resistance.</p>  <p><CON5></p> <p>※ The sensor is determined by the temperature. For example, 24kΩ indicates -20°C.</p>	<table><tr><th>(1) To (2)</th><th>Result</th></tr><tr><td>-22°F / -30°C</td><td>40 kΩ</td></tr><tr><td>-13°F / -25°C</td><td>30 kΩ</td></tr><tr><td>-4°F / -20°C</td><td>23 kΩ</td></tr><tr><td>5°F / -15°C</td><td>17.kΩ</td></tr><tr><td>14°F / -10°C</td><td>13 kΩ</td></tr><tr><td>23°F / -5°C</td><td>10 kΩ</td></tr><tr><td>32°F / 0°C</td><td>8 kΩ</td></tr></table>	(1) To (2)	Result	-22°F / -30°C	40 kΩ	-13°F / -25°C	30 kΩ	-4°F / -20°C	23 kΩ	5°F / -15°C	17.kΩ	14°F / -10°C	13 kΩ	23°F / -5°C	10 kΩ	32°F / 0°C	8 kΩ
(1) To (2)	Result																	
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23°F / -5°C	10 kΩ																	
32°F / 0°C	8 kΩ																	
2	<p>Reset the unit and Input Test 1 Mode. (Push the button 1 time)</p>																	
3	<p>Check the <u>Black to Blue</u>.</p> 	<table><tr><th>Status</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">Test 1 mode</td><td>230 V</td><td>Go to the 4</td></tr><tr><td>Other</td><td>Change the PCB</td></tr></table>	Status	Result	SVC Action	Test 1 mode	230 V	Go to the 4	Other	Change the PCB								
Status	Result	SVC Action																
Test 1 mode	230 V	Go to the 4																
	Other	Change the PCB																
4	<p>Input Test 2 Mode. (Push the button 1 time)</p>																	
5	<p>Check the <u>Black to Blue</u>.</p> 	<table><tr><th>Status</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">Test 2 mode</td><td>0 ~ 2 V</td><td>Explain to customer</td></tr><tr><td>Other</td><td>Change the PCB</td></tr></table>	Status	Result	SVC Action	Test 2 mode	0 ~ 2 V	Explain to customer	Other	Change the PCB								
Status	Result	SVC Action																
Test 2 mode	0 ~ 2 V	Explain to customer																
	Other	Change the PCB																

Reference

1. TEST MODE and Removing TPA

1. How to make TEST MODE

If you push the test button on the Main PCB, the refrigerator will be enter the TEST MODE.



Main PWB

*** 1 time : Comp / Damper / All FAN on
(All things displayed)**

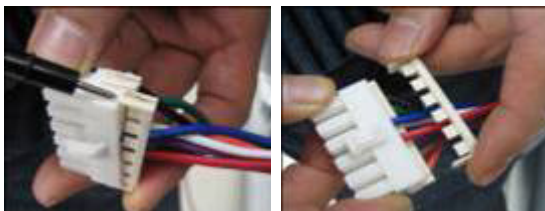


*** 2 times : Forced defrost mode
(22 22 displayed)**



2. How to remove Terminal Position Assurance (TPA)

<AC TPA>



<DC TPA>



※ After measure the values, you should put in the TPA again.

2. TEMPERATRUE CHART - FRZ AND ICING SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	73.29 kΩ	4.09 V
-30°F (-35°C)	53.63 kΩ	3.84 V
-21°F (-30°C)	39.66 kΩ	3.55 V
-13°F (-25°C)	29.62 kΩ	3.23 V
-4°F (-20°C)	22.33 kΩ	2.89 V
5°F (-15°C)	16.99 kΩ	2.56 V
14°F (-10°C)	13.05 kΩ	2.23 V
23°F (-5°C)	10.10 kΩ	1.92 V
32°F (0°C)	7.88 kΩ	1.63 V
41°F (5°C)	6.19 kΩ	1.38 V
50°F (10°C)	4.91 kΩ	1.16 V
59°F (15°C)	3.91 kΩ	0.97 V
68°F (20°C)	3.14 kΩ	0.81 V
77°F (25°C)	2.54 kΩ	0.67 V
86°F (30°C)	2.07 kΩ	0.56 V
95°F (35°C)	1.69 kΩ	0.47 V
104°F (40°C)	1.39 kΩ	0.39 V

3. TEMPERATRUE CHART - REF AND DEF SENSOR

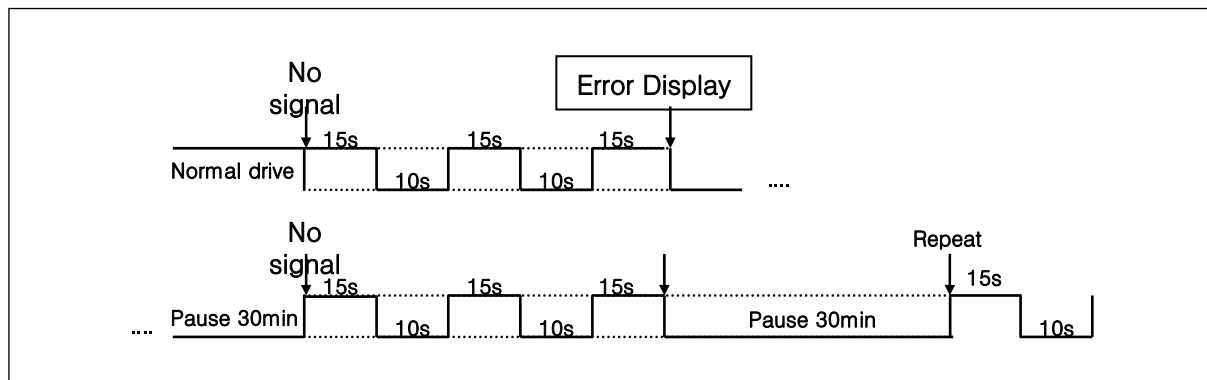
TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.48 V
-30°F (-35°C)	169.8 kΩ	4.33 V
-21°F (-30°C)	129.3 kΩ	4.16 V
-13°F (-25°C)	99.30 kΩ	3.95 V
-4°F (-20°C)	76.96 kΩ	3.734 V
5°F (-15°C)	60.13 kΩ	3.487 V
14°F (-10°C)	47.34 kΩ	3.22 V
23°F (-5°C)	37.55 kΩ	2.95 V
32°F (0°C)	30 kΩ	2.67 V
41°F (5°C)	24.13 kΩ	2.40 V
50°F (10°C)	19.53 kΩ	2.14 V
59°F (15°C)	15.91 kΩ	1.89 V
68°F (20°C)	13.03 kΩ	1.64 V
77°F (25°C)	10.74 kΩ	1.45 V
86°F (30°C)	8.89 kΩ	1.27 V
95°F (35°C)	7.40 kΩ	1.10 V
104°F (40°C)	6.20 kΩ	0.96 V

4. TEMPERATRUE CHART - AMBIENT SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.79 V
-30°F (-35°C)	169.8 kΩ	4.72 V
-21°F (-30°C)	129.3 kΩ	4.64 V
-13°F (-25°C)	99.30 kΩ	4.54 V
-4°F (-20°C)	76.96 kΩ	4.43 V
5°F (-15°C)	60.13 kΩ	4.29 V
14°F (-10°C)	47.34 kΩ	4.13 V
23°F (-5°C)	37.55 kΩ	3.95 V
32°F (0°C)	30 kΩ	3.75 V
41°F (5°C)	24.13 kΩ	3.54 V
50°F (10°C)	19.53 kΩ	3.31 V
59°F (15°C)	15.91 kΩ	3.07 V
68°F (20°C)	13.03 kΩ	2.83 V
77°F (25°C)	10.74 kΩ	2.59 V
86°F (30°C)	8.89 kΩ	2.35 V
95°F (35°C)	7.40 kΩ	2.13 V
104°F (40°C)	6.20 kΩ	1.91 V
113°F (45°C)	5.19 kΩ	1.71 V

(1) ~ July 2007

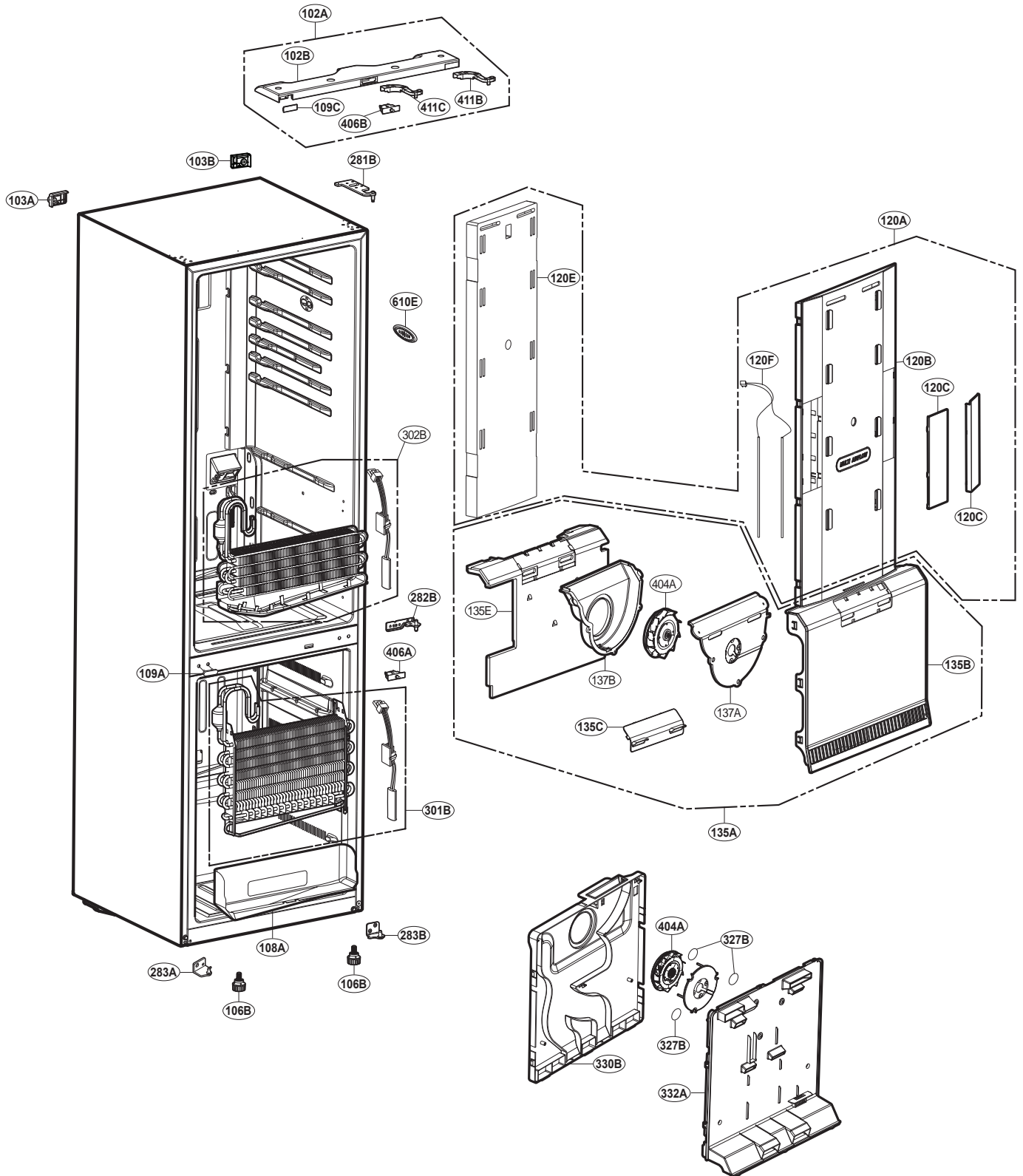
After sending a signal to the fan, the MICOM checks the BLDC fan motor's lock status. If there is no feedback signal from the BLDC fan, the fan motor stops for 10 seconds and then is powered again for 15 seconds. To determine that there is a fan motor malfunction, this process is repeated 3 times. If the fan motor is determined to be defective, the error code will be shown in the display for 30 minutes. At this point, the process will be repeated until the fan motor operates normally. If normal operation is achieved, the error display is erased and the MICOM is reset automatically.



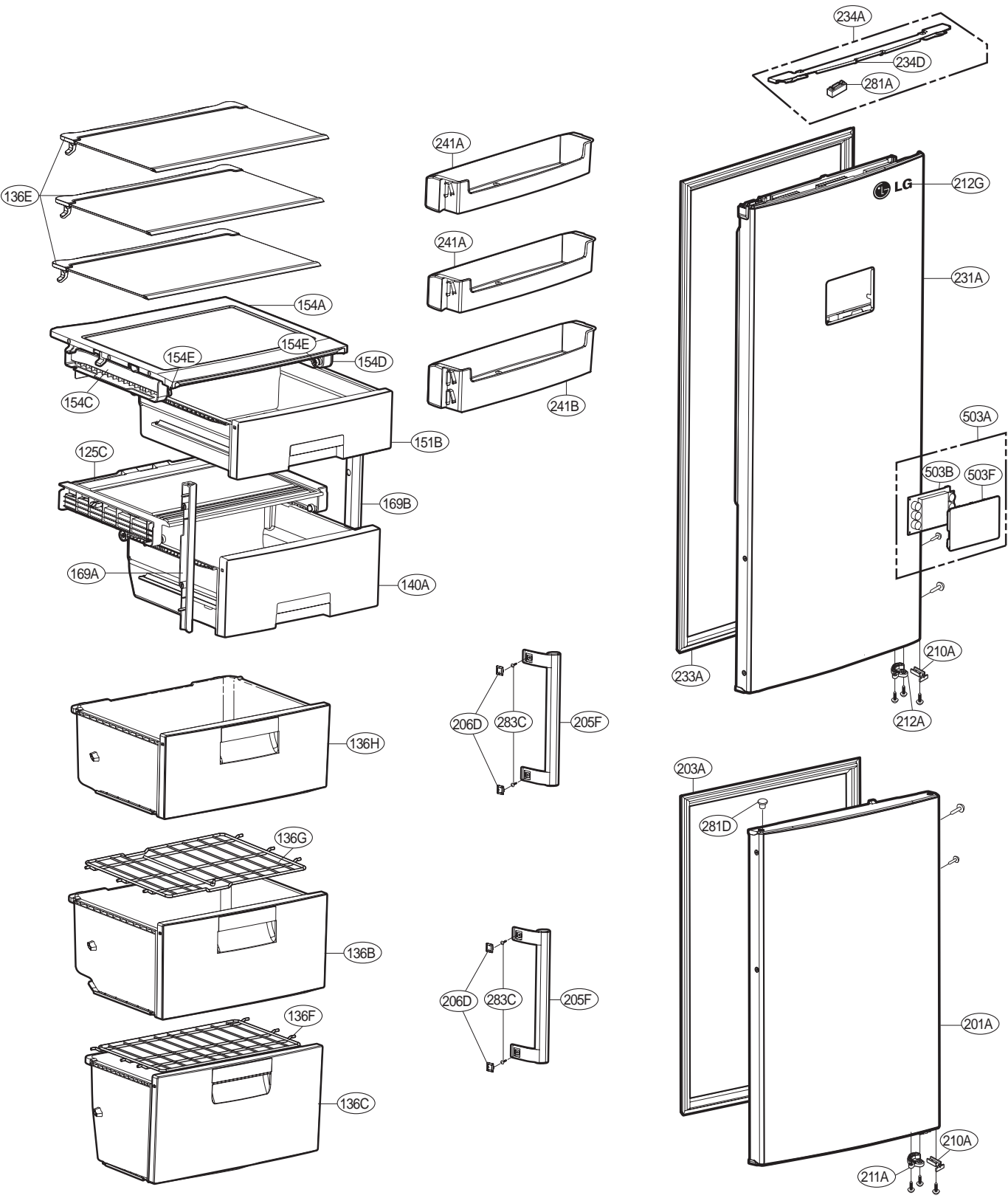
EXPLODED VIEW

Ref. No : GB70****TZ

▼ The parts of refrigerator and the shape of each part are subject to change in different localities.



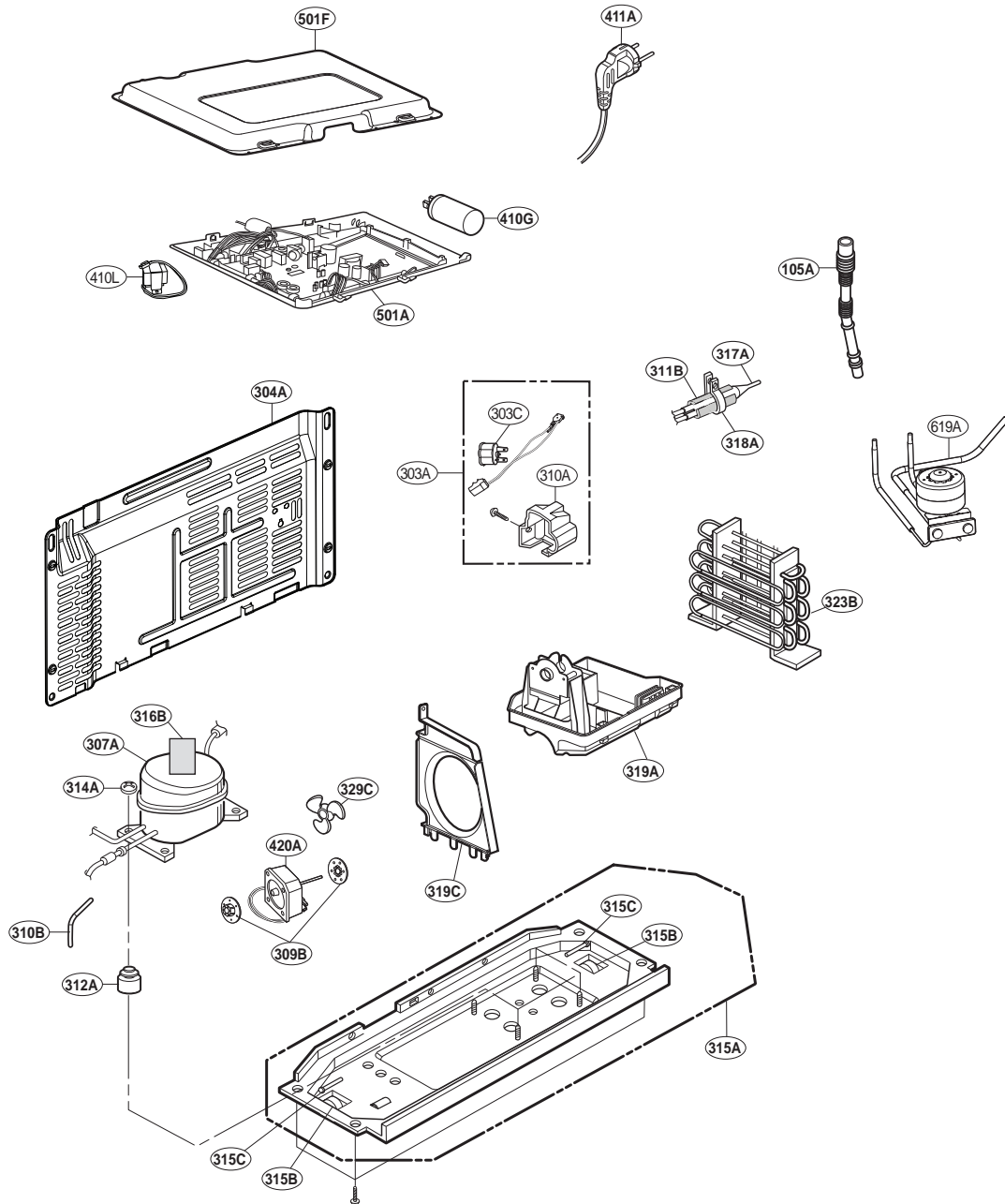
Ref. No : GB7043**T*



EXPLODED VIEW

Ref. No : GB71****(A/B)V, GB71****(G/H)Z, GB7143**RZ, GB7138**XZ, GB70****TZ

▼ The parts of refrigerator and the shape of each part are subject to change in different localities.





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